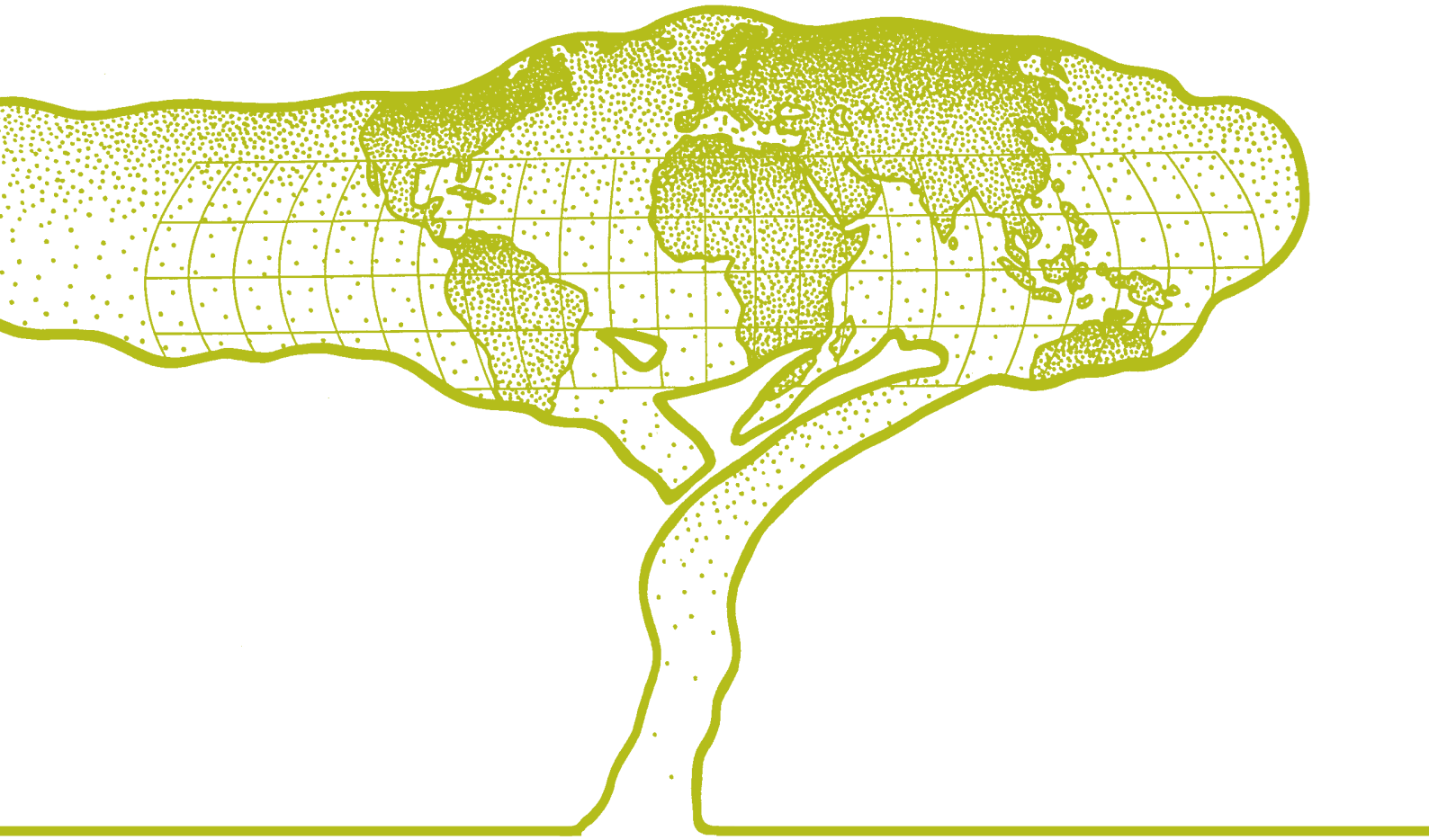
View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Helsingin yliopiston digitaalinen arkisto

UNIVERSITY OF HELSINKI
Viikki Tropical Resources Institute
VITRI

TROPICAL FORESTRY REPORTS 33



Pia Katila

Devolution of forest-related rights: Comparative analyses of six developing countries

UNIVERSITY OF HELSINKI
Viikki Tropical Resources Institute
VITRI

TROPICAL FORESTRY REPORTS

TROPICAL FORESTRY REPORTS contains (mainly in English) doctoral dissertations, original research reports, seminar proceedings and research project reviews connected with Finnish-supported international development cooperation in the field of forestry.

Publisher Viikki Tropical Resources Institute (VITRI)
P.O. Box 27, FI-00014 University of Helsinki, Finland
(address for exchange, sale and inquiries)

Editor Olavi Luukkanen

Telephone +358-9-191 58643
Telefax +358-9-191 58646
E-mail Olavi.Luukkanen@helsinki.fi
Website www.mm.helsinki.fi/mmeko/vitri

Cover Design Lesley Quagraine

Suggested reference abbreviation:
Univ. Helsinki Tropic. Forest. Rep.

Devolution of forest-related rights:
Comparative analyses of six developing countries

Pia Katila

Academic dissertation

To be presented, with the permission of the Faculty of Agriculture and Forestry of the University of Helsinki, for public discussion in Auditorium XII of the University of Helsinki Main Building, Unioninkatu 34, on 8 February 2008 at 12 o'clock noon.

Helsinki 2008

Supervisor: Professor Olavi Luukkanen
Director
Viikki Tropical Resources Institute (VITRI)
Department of Forest Ecology
University of Helsinki
Helsinki
Finland

Reviewers: Dr. Eeva Hellström
Director
Forest Academy for Decision-Makers
Finnish Forest Association
Helsinki
Finland

Docent Markku Simula
Department of Forest Economics
University of Helsinki
Helsinki
Finland

Opponent: Dr. Brent Swallow
Principal Scientist
World Agroforestry Centre (ICRAF)
Nairobi
Kenya

ISBN 978-952-10-4517-2 (paperback)
ISBN 978-952-10-4518-9 (PDF)
Helsinki 2008
Hakapaino Oy

ABSTRACT

The devolution of forest-related rights to the local level and increasing the participation of those whose livelihoods are closely related to forests have become important elements in policies that aim towards sustainable forest management and poverty alleviation. The central role of devolution in the forest policies of many developing countries emphasises the need for information regarding the contents and extent of forest-related rights that can be transferred to the local level. This study concentrated on the national level legal frameworks that define the ways in which rights and responsibilities can be devolved. The case studies in Laos, Nepal, Vietnam, Kenya, Mozambique and Tanzania represented the main ways used in devolving forest-related rights to communities or households in these countries. Comparative case study strategy was used to analyse and compare eleven cases.

The objectives of this study were to 1) analyse the contents and extent of forest-related rights that can be devolved to the local level according to the prevailing legal frameworks in six developing countries, 2) to develop an empirical typology that represents the main types of devolution, and 3) to compare the cases against a theoretical ideal type to assess in what way and to what extent the cases are similar to or differ from the theoretical construct.

Fuzzy set theory, Qualitative Comparative Analysis and ideal type analysis were used in analysing the case studies and in developing an empirical typology. The theoretical framework, which guided data collection and analyses, was based on institutional economics and theories on property rights, common pool resources and collective action. On the basis of the theoretical and empirical knowledge, the most important attributes of rights are use rights, management rights, exclusion rights, transfer rights and the duration and security of the rights. The ideal type was defined as one where local actors have been devolved comprehensive use rights, extensive management rights, rights to exclude others from the resource and rights to transfer these rights. In addition, the rights are to be secure and held perpetually. The ideal type was used to structure the analysis and as a tool against which the cases were analysed.

The contents, extent and duration of the devolved rights vary greatly. However, the results show that devolution has mainly meant the transfer of use rights to the local level, and has not really changed the overall state control over forest resources. Management rights were mainly rather restricted or restricted, meaning that the right holder participates, or has a limited role in making decisions regarding the harvesting and management of the resource. There was a clear tendency to devolve the rights to enforce rules and to monitor resource use and condition more extensively than the powers to decide on the management and development of the resource.

The empirical typology of the cases differentiated between five different types of devolution. The types can be characterised by the devolution of 1) restricted use and control rights, 2) extensive use rights but restricted control rights, 3) extensive rights, 4) insecure, short term use and restricted control rights and 5) insecure extensive rights.

Overall, the case studies conformity to the ideal type was very low: only two cases were similar to the ideal type, all other cases differed considerably from the ideal type. The restricted management rights were the most common reason for the low conformity to the ideal type (eight cases). In three cases, the short term of the rights, restricted transfer rights,

restricted use rights or restricted exclusion rights were the reason or one of the reasons for the low conformity to the ideal type. In two cases the rights were not secure.

The legal framework, which defines the options and possibilities for devolution of forest-related rights, should address the different attributes of rights. A narrow focus on some aspects of property rights, without considering the overall combined effects of the different attributes of rights, is unlikely to create favourable conditions for livelihood improvements or sustainable forest management.

Key words: forest policy, devolution, decentralisation, property rights, forest-related rights, participatory forest management, community forestry

Author's address:
Pia Katila
Finnish Forest Research Institute
Unioninkatu 40A
FIN-00170 Helsinki, Finland
e-mail: pia.katila@metla.fi

PREFACE

The broad idea for this study developed under the Finnish Forest Research Institute project "Forests in the Globalising World". I am grateful to Professor Matti Palo for the opportunity to work in the project, which also enabled my return to the professional life in Finland after living more than seven years in Southeast Asia.

I want to thank Professor Olavi Luukkanen for his support and the opportunity to contribute to the Ministry of Foreign Affairs commissioned research "Partnerships between Public and Private Actors in Forest Sector Development" undertaken by the Viikki Tropical Resources Institute in 2005. The collection of the case study material for this project also served my doctoral research.

My warmest thanks go to my husband Dr. Marko Katila. I am grateful for his guidance, valuable comments and inspiration throughout the project. His encouragement and personal interest in the topic greatly supported my work. I would also like to thank the reviewers of this thesis, Dr. Eeva Hellström and Docent Markku Simula for their constructive and highly useful comments.

I am very grateful to Mr. Gerardo Mery for his kind support and for the opportunity to work as an associate researcher in the International Union of Forest Research Organizations' Special Project "World Forests, Society and Environment". It enabled me to work in the Finnish Forest Research Institute and benefit from its facilities. This opportunity has greatly helped the realisation of the study.

The Finnish Society of Forest Science supported the study with two grants in 2003 and 2007 and the Finnish Cultural Foundation with a one year grant in 2004. I want to thank these organisations for providing financial support for the study.

Many people have greatly helped me in the course of this research by providing information on the study countries. I am grateful to all of them for their help. I especially want to thank Mr. Tom Blomley, Senior Adviser, Ministry of Natural Resources and Tourism, Tanzania; Mr. Todd Sigaty, Director, Village Focus Organisation; and Mr. Michael Makokha, FAO Kenya National Coordinator for the information they kindly provided. Furthermore, I would like to thank Ms. Heidi Vanhanen for many interesting discussions on forests and livelihoods. I am also grateful for my parents for their support and for my daughter, Miia at the London School of Economics, for her help in language checking.

Helsinki, December 2007
Pia Katila

Acronyms and abbreviations

CBFM	Community-Based Forest Management (Tanzania)
CFD	Community Forestry Division (Nepal)
CFUG	Community forest user group (Nepal)
CGC	Comité de Gestão Comunitária, community management committee (Mozambique)
ChFDP	Churia Forest Development Project (Nepal)
COGEP	Comité de Gestão Participative, local resource management council (Mozambique)
DAFEO	District Agriculture and Forestry Extension Office (Laos)
DFO	District Forest Office (Nepal)
DoF	Department of Forests (Nepal)
DUAT	Direito de Uso Aproveitamento de Terra, right to use and benefit from land (Mozambique)
ERS	Economic Recovery Strategy (Kenya)
FAO	Food and Agriculture Organisation of the United Nations
FBD	Forestry and Beekeeping Division (Tanzania)
5MHRP	5 Million Hectare Reforestation Programme (Vietnam)
FMU	Forest Management Unit (Laos)
FPD	Forest Protection Department (Vietnam)
FSSP	Forest Sector Support Programme (Vietnam)
FWL	Forest and Wildlife law (Mozambique)
GRID	Gender Resource Information and Development Centre (Laos)
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
GVFO	Group of Village Forest Organisations (Laos)
HMG	His Majesty's Government (Nepal)
IFAD	International Fund for Agricultural Development
IUCN	World Conservation Union
JFM	Joint Forest Management (Tanzania)
KFS	Kenyan Forest Service
LFPD	Law on Forest Protection and Development (Vietnam)
LFUG	Leasehold forest user group (Nepal)
LUP/LA	National Land Use Planning and Land Allocation Programme (Laos)
MAF	Ministry of Agriculture and Forestry (Laos)
MARD	Ministry for Agriculture and Rural Development (Vietnam)
MENR	Ministry of Environment and Natural Resources (Kenya)
MFA	Ministry for Foreign Affairs, Finland
MNRT	Ministry of National Resources and Tourism (Tanzania)
MONRE	Ministry of Natural Resources and the Environment (Vietnam)
MPFS	Master Plan for the Forestry Sector (Nepal)
NAFRI	National Agriculture and Forestry Research Institute (Laos)
NBCA	National Biodiversity Conservation Areas (Laos)
NGO	Non-Governmental Organisation
NTFP	Non-timber forest product
PAFO	Provincial Agriculture and Forestry Office (Laos)
PES	Payments for Environmental Services
PFA	Production forest area (Laos)
PFM	Participatory Forest Management (Tanzania)

PROAGRI	National Programme for Agricultural Development (Mozambique)
PROFOR	UNDP Programme on Forests
QCA	Qualitative Comparative Analysis
REDD	Reduced emissions from deforestation and degradation
Rs	Nepalese Rupee
SFE	State Forest Enterprise (Vietnam)
SMFE	Small and medium forest enterprises
TLUC	Temporary Land Use Certificate (Laos)
TNFP	Tanzania National Forest Programme (Tanzania)
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
USD	United States dollar
VFMA	Village Forest Management Area (Tanzania)
VFO	Village Forest Organisation (Laos)
WB	World Bank
WRM	World Rainforest Movement
WWF	World Wildlife Fund

CONTENTS

1 INTRODUCTION

1.1 Sustainable development, poverty reduction and forests

Sustainable development and poverty reduction have emerged as principal concepts in forestry development. The sustainable forest management principle adopted at the United Nations Conference on Environment and Development states that "Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations" (UN 1992). Since the adoption of the United Nations Millennium Declaration in 2000, poverty reduction has received a central role in national development strategies and has become the paramount goal of development cooperation. One of the Millennium Development Goals is to ensure environmental sustainability (UN 2006).

Forests are one of the most important natural resources for rural people in developing countries (WB 2004). According to the World Bank (2004) estimate, forests contribute to the livelihoods of about 1.6 billion people worldwide. Forest resources are especially important for the poor. They contribute directly to the livelihoods of 90% of those living with less than 1 USD/day. The world's 60 million indigenous people are almost totally dependent on natural forests. Forests contribute to livelihoods through providing subsistence goods and income from the sale of forest products, by providing inputs for agriculture, and through employment. Forests are also an important reserve to which people can turn to in times of hardships. In addition to timber and NTFPs, forests provide a range of environmental services and are important for cultural and religious heritage.

Deforestation and forest degradation threaten biodiversity and the provision of forest products and forest environmental services. Even though the forest area is growing in some regions of the world, deforestation is a serious problem in most developing countries. Globally, annual forest loss is estimated at 13 million hectares (FAO 2007a). The role of forests as a critical component in the ecological balance of the world has received increased recognition with the worldwide acknowledgement of global warming. It has been estimated that 18-25% of the annual global greenhouse gas emissions are produced by deforestation (UN 2007). Preventing deforestation is an important way to mitigate global warming (Stern 2007).

The future of forests depends very much on the institutional arrangements that regulate land and forest tenure. Tenure refers to the relationship between individuals, groups and organisations with respect to land and associated natural resources (Ciparisse 2003). Tenure is defined by property rights, which can be based on statutory or customary rules. Property rights define the relationship between the right holder and all others in respect to something of value. By defining the rights to access, use and manage forests and by allocating decision making authority over the resource, property rights define local people's options and possibilities to use forest resources for subsistence or for income (Libecap 1989, Wiebe and Meinzen-Dick 1998). Through defining who can access and benefit from resources across time, property rights also have a profound influence on the incentives for the conservation and sustainable use of forests.

In developing countries, most forests are under public ownership (FAO 2005). Often the governments have not been able to manage and control the forest resources that are officially under their control. Deforestation and forest degradation continue in many countries at alarming rates. In Africa and Southeast Asia, the annual forest losses between 2000 and 2005

were 4 million and over 2.8 million hectares respectively (FAO 2007a). Devolution, which refers to the transfer of forest-related rights and responsibilities to the local level, has become one of the main avenues towards sustainable forest management, rural development and poverty reduction. The central role of devolution policies in promoting sustainable forest management and enhancing local development highlights the need for information regarding forest-related rights that can be transferred to the local level. This study focuses on the different ways that forest-related rights can be devolved to the local level according to the prevailing legal frameworks and especially on the contents and extent of the devolved rights in six developing countries (Laos, Nepal, Vietnam, Kenya, Mozambique and Tanzania).

1.2 Forest ownership

Most forests (84%) and other wooded lands (90%) worldwide are officially under public ownership. In the developing countries in Africa and Asia, forests are almost entirely under state control. In Africa 98% of forest area and 94% of other wooded land and in Asia 94% of forest area and 89% of other wooded land are under public ownership. Private ownership is more prevalent in Europe (excluding the Russian Federation), North and Central America, South America and Oceania. In these regions private ownership covers about 51%, 30%, 17% and 24% of forest area respectively (FAO 2005).

The general term of public ownership covers different kinds of management arrangements. In practice, large parts of the forests that are officially under public ownership are under customary resource management systems or subject to various participatory management arrangements between the state and local communities or households. It has been estimated that 11% of the world's forests are either owned or to some degree managed by communities (Table 1). A small part of this area is officially owned by communities or indigenous groups. The area under community ownership or management is higher in the developing countries where it has been estimated to cover 22% of the forest area (White and Martin 2002). As an example, the forest area owned or managed by local communities, user groups or individuals covers about 18% of the total forest area in 17 South and Southeast Asian countries (about 65 million ha) (Reeb and Romano 2006). Over half of this area is owned or managed by communities. As formal community ownership is insignificant in these countries, this area is basically under different joint forest management or lease systems or under arrangements where local communities have been granted certain use rights. Formal community or customary ownership is notable in Mexico and Papua New Guinea. In Mexico, 80% of forest land is held as common property by ejidos and forest communities. In Papua New Guinea, practically all forests are owned by customary clan groups (White and Martin 2002).

Table 1. Estimated distribution of forest ownership in percentage of the total forest area (White and Martin 2002).

	Public ownership		**Private ownership**	
	Administered by government	Managed by community /indigenous group	Community/ indigenous group	Individual/firm
Globally	77%	4%	7%	12%
In developing countries	71%	8%	14%	7%

In many developing countries, forests have been under state control since colonial times. The colonial powers largely ignored customary tenure systems that governed forests. In many countries, unoccupied lands were declared state lands. In some countries, the colonial powers recognised customary land tenure systems to some degree, but the recognition was often ambivalent. After independence customary tenure systems were further overridden by new land and resource laws that pursued national unity and aimed at strengthening territorial claims (Arnold 1998, Bruce 1999).

People were seen as a threat to the conservation of forest resources (Poteete and Ostrom 2002) and to the sound exploitation of forests (Baland and Platteau 1999). Large forest areas were reserved for wood production or conservation, mostly ignoring the local resource management systems (Barrow et al. 2002). Forest resources were needed to create revenues for the development of the newly independent nations. Extensive areas were placed under timber harvesting concessions that further undermined customary forest management (Arnold 1998, Poffenberger 1999). Local people were increasingly alienated from forest resources. This has contributed to deforestation and forest degradation. In Thailand for example, ethnic minorities' customary rights have been undermined by the establishment of National Forest Reserves, national parks and other protected areas, which cover practically all existing natural forests (Neef et al. 2003).

It has been often assumed that customary tenure systems would disappear with population growth, economic development, technological change and increased land scarcity. However, diverse customary, and in most cases community-based, resource management systems continue to prevail in rural areas in many developing countries (Bruce 1999). In sub-Saharan Africa de facto land ownership is still dominantly based on customary land tenure systems (Nelson 2001). Only few African and Asian countries have recognised customary tenure and have given it an equal status with other tenure regimes (e.g. Tanzania, Mozambique, Uganda and the Philippines) (Alden Wily and Mbaya 2001, Colchester 2001). In these countries, common property regimes are also recognised in the law.

Privatisation and declaration of forests areas as forest reserves or conservation areas have undermined customary tenure systems and limited local people's access to forests. However, despite the strong trend to reserve forests under state control, in many African countries over half of the forests are still unreserved and not under any formal management. This is the case for example in Kenya, Tanzania and Uganda (Alden Wily and Mbaya 2001).

The dichotomy between the national statutory laws and customary land tenure and resource management systems has prevailed since the colonial times to the present (Bruce 1999, Barrow et al. 2002). Overlapping statutory and customary tenure systems have led to disputes and competing claims over land and natural resources. This has undermined the security of both systems (Christy et al. 2007) and contributed to the disempowerment of local people and communities in controlling and managing forest resources (Poffenberger 1999).

1.3 Decentralisation and devolution of forest management authority

The failures of the centralised resource management approaches have been widely acknowledged. The main reasons behind the failure of the centralised forest management have been the vast size of the forest areas, limited financial resources and administrative,

technological and enforcement capacities of the states, corruption, insufficient information concerning forest ecosystems, and the failure to recognise customary rights to land (Panayotou and Ashton 1992, Baland and Plateau 1996). Consequently, governments have increasingly started to look for decentralised, local level management models, which would enhance sustainable resource management and support local development.

Decentralisation refers to the formal transfer of powers from the central government to actors or institutions at lower levels in an administrative and territorial hierarchy (Mawhood 1983 referred to in Agrawal and Ostrom 2001). It is closely connected to democratisation processes and endeavours to transfer powers closer to those who are affected by the exercise of these powers (Agrawal and Ostrom 2001). Decentralisation has also been strengthened by the increasing recognition of indigenous and other local communities' rights to the lands they have traditionally managed (White and Martin 2002). Decentralisation in forest management is part of the general trend towards more decentralised decision making and increased local participation. In relation to natural resources, decentralisation encompasses the transfer of authority over natural resources decision making from the central government to local governments or administrative units (see e.g. Larson 2002 for Nicaragua and Nygren 2005 for Honduras) and to non-state local actors (see e.g. Richards 1997 for Latin America, Ribot 2003 for sub-Saharan Africa and Tran Ngoc Than and Sikor 2005 for Vietnam). The term devolution is generally used to refer to the transfer of rights and responsibilities to local communities, groups, committees and households. Through the devolution of rights, the decision making authority regarding the use and management of forest resources can also be shifted to the local level. In devolution, the management authority is devolved to actors that should be accountable to the people they represent (Agrawal and Ribot 1999).

In the literature, the terms decentralisation and devolution have often been used interchangeably. The term devolution is used in this study for the sake of consistency, even though in some cases the rights and responsibilities transferred to local level clearly do not include any real transfer of authority over forests and/or the nature of accountability of representative authorities or organisations to their constitutes is unclear or weak.

Devolution aims to promote more equitable and efficient local management and development through the increased participation of local actors. There are several arguments that favour the devolution of forest management authority from the central authorities to the local resource users. Local people often have a good knowledge of the resource. They are close to the resource and thus in a better position than the government authorities to manage and monitor its use and condition. They rely on the resource for subsistence use or for the access to products for sale and thus have more at stake in the management for continued availability of forest products and services. Consequently, local management has the potential to be less costly and more efficient than management by distant government authorities. Devolving rights to local level can also help in bridging the gap between customary and statutory rights and harmonise relations between the government and local people (Knox and Meinzen-Dick 2001).

When authority is devolved to local level there have to be actors or organisations, which can effectively use this authority on behalf of the people that they represent. The nature of the organisation to which authority is devolved affects the outcomes of devolution and determines whether the change will promote or undermine representative, accountable and equitable natural resources management (Ribot 2003). Ribot (2003) has summarised that "*downwardly accountable* or *representative authorities* with *meaningful discretionary powers* are the basic

institutional elements of decentralisation that should lead to local efficiency, equity and development" (emphasis original).

In practice, devolution has either empowered traditional organisations or has resulted in the development of new organisations to represent local people. In some cases, the resource management authority has been devolved to existing administrative village level organisations. This has been the case for example in Tanzania, where village is the lowest administrative government unit in rural areas (Alden Wily and Dewees 2001). In some countries, traditional leaders have almost completely lost their authority. This is the case for example in Tanzania (Campbell and Shackleton 2001). On the other hand, in some countries or regions, traditional leaders still exercise strong control over resources, as for example in parts of Cameroon, Ghana, Mali and Malawi (Alden Wily 2002). However, traditional authority systems can be undemocratic and unrepresentative and thus not always suitable for the development of more inclusive and democratic resource management systems (Ribot 2003).

In many cases, traditional authority systems work parallel to state supported systems (Campbell and Shackleton 2001). The overlapping and conflicting mandates and jurisdictions of the traditional and modern authority systems can be a serious source for conflicts (e.g. Nemarundwe 2004). Conflicts between traditional authority systems and new organisations have been avoided by including traditional leaders into the new resource management organisations (Campbell and Shackleton 2001).

The success of the new local level organisations created for resource management depends on how well they conform to the existing natural and social conditions. The efficiency and equity of new organisations are greatly affected by their legitimacy and representativeness, as well as their ability to enhance wide participation within local resource users and negotiate solutions to resource related conflicts.

1.4 Devolution of forest management authority in Africa and Asia

Devolution is put into practice through changing the policies and legal framework, which define property rights to resources. The framework is based on land and forest legislation as well as other environmental legislation. In many countries the ongoing changes in the legal framework involve a clear tendency to clarify and enhance the rights of local communities (Christy et al. 2007). This includes the formalisation of informal or customary tenure systems by codifying them in various ways in the legislation (Alden Wily 2001).

Important change is underway in the forestry sector in many Asian and African countries[1]. In Africa, at least 35 countries have enacted new forest laws or drafted a new forest law since 1990. A common legal change is the provision of an opportunity for local people to participate in forest management. Developments that in some way involve local communities in forest management are underway in over 30 African countries (Alden Wily 2002). However, the practical implementation of the new legislation is very recent in most countries. It has been mostly implemented through trial and pilot projects.

[1] Decentralisation and devolution are also important trends in the forestry sector in Latin America, but that is outside of the scope of this study.

In Asia, community participation in forest management started in Nepal and the Philippines in the 1970's (e.g. Pulhin 2000, Acharya 2002). Since 1990, different forms of community participation in forest management have received formal support in the national forest policies and forest laws of many countries in the region, for example in India, Cambodia, Laos, Myanmar and Vietnam (Lin 2005, de Lopez 2005, MAF 2005, Nguyen Quang Tan 2006, WB 2006a). In these countries, the forest legislation supports household and community participation in forest management to varying degrees. In China, forest management is decentralised through contracting or leasing forest land to co-operatives, households and private enterprises (Yamane 2001). In Thailand, community forest legislation was under discussion for more than a decade. The bill was finally passed in November 2007. The bill entitles communities, which have resided in the area for more than ten years, to manage and use forests according to protection guidelines (Wipatayotin 2007). In Indonesia, natural resource management has been for a large part decentralised to district governments (McCarthy 2001).

In most Asia and African countries, the legal framework enabling communities and households to formally participate in forest management is recent. In many countries, the framework is still under development and regulation and guidelines for implementing devolution policies are lacking. Because of this, the experiences from devolution are somewhat limited. However, the research clearly indicates that devolution has potential to promote sustainable forest management and local livelihoods. The impacts of devolution vary between countries, within countries and within communities (e.g. Fomété and Vermaat 2001, Odera 2004). Impacts on forest condition and availability of forest products have mainly been positive (e.g. Yadav et al. 2003, ChFDP 2004, Odera 2004, WB 2006a).

The problems related to different participatory forest management models and the difficulties in realising the potential for conservation and livelihood improvements are often related to the limited transfer of rights and continuing state control over resources. In India, the joint forest management programme has strong potential to contribute to the improvement of local livelihoods. The realisation of this potential is hampered by incomplete, incoherent and insecure transfer of rights to local communities. This has resulted in the lack of incentives for local communities to consider the long term effects of their actions (Behera and Engel 2006, WB 2006a).

Based on case studies in India and Nepal, Agrawal and Ostrom (2001) conclude that transferring only use rights to the local level does not lead to positive changes in forest condition or improve the relationship between the state and communities. Effective decentralisation requires that local users are allowed at least rights to manage resources and make decisions regarding resource use and exclusion.

In Cameroon, community forestry has potential to contribute to rural development and poverty alleviation. To be successful community forestry should be based on full and enforced legal framework, which safeguards community interests. Communities should have ownership over organisational development and planning. Training in organisational, administrative and technical skills as well as access to finance are also important for developing community forestry (Fomété and Vermaat 2001).

Duru-Haitemba is a much cited example of a successful community-based forest management process in Tanzania. Eight villages are managing over 9 000 hectares of woodland as village forest reserves. The success has been attributed to the following factors: clearly defined

boundaries, congruence between the rules that define the rights and responsibilities and the local conditions, strong village organisations, conflict resolution mechanisms at the village level, clearly defined property rights, and the rights and ability of the villagers to develop a local level resource management organisation (Kajembe et al. 2003, 2005).

The results of a meta analysis of 69 cases of community forestry worldwide indicate that the success of community management is associated with tenure security, clear ownership, correspondence between biophysical and socioeconomic boundaries, effective enforcement of rules and regulations, monitoring, sanctioning, strong leadership with effective local organisation, expectations for future benefits, and common interests among local authorities and community members (Pagdee et al. 2006).

1.5 Purpose of the study

The devolution of forest-related rights has become one of the main means towards sustainable forest management, rural development and poverty reduction. Devolution and increasing participation of local people have an important role in many countries' forest policies. These principles are also increasingly formalised in legislation.

The authority system that covers forest resources forms the basis for sustainable forest management. The technical solutions and requirements for sustainable forest management are likely to succeed only after an equitable arrangement for resource access, use and management has been established (McDonald 2000). Devolution has taken very different forms, ranging from very limited participation to collaborative forest management, joint or co-forest management to community-based forest management, where forest resources are handed over to community or village management. In most cases, devolution has meant development of local level forest management regimes, which are based on sharing of the rights and responsibilities between the state and local level actors.

The ongoing devolution in the forestry sector and the recognition of traditional land rights are expected to mean a "reversal of fortune" for the rural poor (Alden Wily 2001). The different participatory forest management approaches are seen as a partial solution to bringing about sustainable forest management while also improving people's livelihoods. In addition, carbon credit trade and other payments for environmental services are expected to provide significant benefits to the rural communities (Scherr et al. 2003, WWF 2006). Whether these benefits will ever be realised for the rural poor depends very much on the extent and security of their rights to forest land and resources.

Various studies suggest that an increasing share of forest land is under some degree of formal community management (White and Martin 2002, Reeb and Romano 2006). However, claims about devolving forest management have often been made without substantiating what actually has been devolved and in which way. There is a need for information concerning the contents and extent of devolved property rights (Agrawal and Ostrom 2001). This information is crucial for understanding the options and opportunities for subsistence use and income generation as well as the incentives for sustainable forest management created or shaped by the devolution policies.

The purpose of this study is to increase the understanding of the devolution in the forestry sector. The study focuses on the different ways that forest-related rights can be devolved to the local level and especially on the contents of the devolved rights. The objectives of this study are to:

- analyse the contents and extent of forest-related rights that can be devolved to the local level according to the prevailing legal frameworks in the study countries,
- develop an empirical typology that represents the main types of devolution within the cases,
- compare the cases against a theoretical ideal type to assess in what ways and to what extent the cases are similar to or differ from the theoretical construct.

The study describes the devolution of forest-related rights in six countries: Laos, Nepal, Vietnam, Kenya, Mozambique and Tanzania. It concentrates on the national level legal frameworks that define what rights, how and for how long can be devolved to the local level. The case studies represent the main ways in which forest-related rights can be devolved to the local level in the study countries.

Most of the previous studies on the devolution of forest management authority have been descriptive. This study combines aspects of both quantitative and qualitative research by applying Qualitative Comparative Analysis method and fuzzy set theory. With fuzzy sets the case study information can be analysed and categorised according to common criteria. Fuzzy set analyses are used as the basis for the empirical typology of the cases and in comparing the cases to the ideal type.

The previous research has not clearly differentiated between participatory forest management arrangements in conservation areas and in forests outside conservation areas. In conservation areas, the wider societal values related to biodiversity conservation dominate (e.g. national and global biodiversity values). These areas are also normally covered by specific legislation. It is widely recognised that the involvement of local people in conservation area management is often essential. However, because extractive uses in these areas are very restricted, the opportunities for local people to use and benefit from these forests are limited. This study concentrates on the different ways in which management authority has been shared between the state and local communities and/or households outside conservation areas.

The terminology used in connection with the different forms of devolving forest management authority varies greatly. In this study, the term participatory forest management is used as a general term referring to all the different arrangements that in some way involve local people in forest management. The terminology used in the case studies follows the terminology used in the respective legal frameworks. The definitions of the terms are given in the respective case study descriptions. In the general discussion, community is used to refer to a group of people living close to or within forests.

The theoretical framework of the study is presented in Chapter two. The materials, methods and the principles for scoring the cases for the analyses are described in Chapter three. The case studies, the role of devolution in the forest policies and forest tenure in each study country are described in Chapter four. The analyses and results are presented in Chapter five, and the main results and their implications are discussed in Chapter six.

2 THEORETICAL FRAMEWORK

2.1 Economic theory of institutions

The theoretical framework of this study is based on institutional economics. It also builds on the theory on property rights and the theory on the management of common-pool resources and collective action.

The role of economic organisations and institutions in economic behaviour and economies was emphasised by the early institutional economists already in the beginning of the last century. Among the most famous of them were Thorstein Veblen and John R. Commons. According to John R. Commons, collective action controls and liberates individual action. The actual and expected scarcity of the things people want causes conflicts. At the same time it also generates "collective action that sets up order on account of mutual dependence". Collective action creates the rights and duties without which there would be anarchy (Commons 1934). He defined an institution as "collective action in restraint, liberation and expansion of individual action" (Commons 1934). The contribution of the early institutional economists to economic theory was shadowed by the neoclassical tradition, which did not appreciate the role of institutions (North 1990).

The New Institutional Economists' efforts to incorporate institutions in the economic theory and to explain the existence, development and functioning of institutions have again brought institutions to the forefront in the development of economic theory. Institutional economics consists of different views and theories. The common theme in the new institutional economics is the central role of transactions and transaction costs. The costs of contracting and other transaction costs affect the allocation of resources and economic organisation (Eggertsson 1990). Transaction costs are associated with the cost of acquiring information. They include the costs of measuring the valuable attributes of what is exchanged, arranging agreements, and monitoring and enforcing them (Eggertsson 1990, North 1990). Institutions lower transaction costs by establishing a structure to human interaction (North 1990).

The acceptance or rejection of the behavioural assumptions underlying the neoclassical theory is a central distinguishing attribute between different institutional theories. Eggertsson (1990) builds his theory on economic behaviour and institutions on the neoclassical approach, particularly the rational choice model. He calls this approach Neoinstitutional Economics.

Hodgson (1988) rejects the idea of a "calculating, marginally adjusting agent of neoclassical theory". He emphasises the role of habits and routinised behaviour in structuring human interaction. Hodgson defines an institution as a "social organisation, which through the operation of tradition, custom or legal constraint, tends to create durable and routinised patterns of behaviour". Institutions are also seen to play an enabling role by providing information on the likely actions of others. Thus, institutions make regular and predictable behaviour possible in a world of uncertainty, complexity and overload of information (Hodgson 1988).

North's theory (1990) of institutions is constructed from a theory of human behaviour combined with the theory of the costs of transacting. He states that it is essential to modify the assumption that human behaviour is motivated by maximising utility. According to North, individual choices are made on the basis of incomplete information and subjective models of reality. Ideas, ideologies and altruism also affect the choices made. North (1990) defines

institutions as the "rules of the game in a society" or "the humanly devised constraints that shape human interaction". Institutions guide human interaction, reduce uncertainty and provide structure to everyday life, i.e. they "are the framework within which human interaction takes place". North (1990) makes a crucial distinction between institutions and organisations. He defines organisations "as groups of individuals bound by some common purpose to achieve objectives".

Institutions consist of both formal and informal components. Formal institutions include constitutions, laws, bylaws and contracts, which define the general rules for human interaction as well as the rules applying in specific situations. Informal rules are based on culturally derived customs, traditions and codes of behaviour (North 1990). Formal rules can be created and changed by political and juridical decisions. Changes in formal rules can thus be very quick. Informal rules on the other hand are more persistent, evolve slowly and do not always respond to the changes in the formal rules. Formal and informal rules, together with the way they are enforced, form the institutional framework where all individual action takes place (North 1990).

2.2 Property rights

Property rights are defined by statutory and/or customary rules. Rights authorise the holder to use, manage and benefit from resources. According to Bromley (1991) property rights are “the capacity to call upon the collective to stand behind one’s claim to a benefit stream”. In general, property rights define the relationship between the right holder and all others with respect to something of value. Rights are meaningless without the correlated duty imposed on all others to respect the rights of those who hold them.

The existing structure of rights defines the opportunities for individuals and organisations (North1990). It determines the distribution of benefits from the resource by defining who can use the resource, how, for what, when and for how long (Wiebe and Meinzen-Dick 1998). Property rights are thus important in forming the incentives that affect decision making regarding the management and use of resources, including investing in, sustaining and improving the resource (Libecap 1989, Wiebe and Meinzen-Dick 1998, Knox and Meinzen-Dick 2001). Property rights are critical in defining the income earning options of the people and wealth distribution between them. Property rights also convey authority and control over the resources (Libecap 1989, Wiebe and Meinzen-Dick 1998).

The thesis that property rights would develop towards socially efficient arrangements has been criticised for ignoring the role of social and political processes that affect the formation of property rights (Libecap 1989, Eggertsson 1990, North 1990). Political processes have a decisive role in the formation of property rights. The political processes through which property rights are defined and enforced have profound distributional implications. They result in the allocation of the benefits and costs of resource use between individuals and groups. By allocating decision-making authority these processes also determine who the key actors are in the economic system. On the other hand, the existing structure of economic interests and power relations influence political decision making (Libecap 1989, North 1990).

Property rights are seen in this study as one of the crucial social institutions that define access, use and management of natural resources. They also define the options and opportunities to benefit from the resources, and shape the incentives for sustainable resource management.

This study focuses on the formal rules that are defined in the legislation. For practical reasons, the inclusion of informal rules is not possible. Informal rules can be very location and time specific and their analysis needs to be conducted at the local level. In addition to property rights, the resource outcomes, i.e. the condition of the forests and livelihood outcomes, are affected by demographic and cultural factors, technology and markets, resource characteristics, and biophysical factors. Property rights are not the sole determinant of the outcomes, but a central factor that mediates the effects of the other factors (Figure 1). Those holding rights also need to be able to derive benefits from the resource through investing labour and capital. They need to have the capacities and technologies necessary for obtaining benefits (Ribot and Peluso 2003).

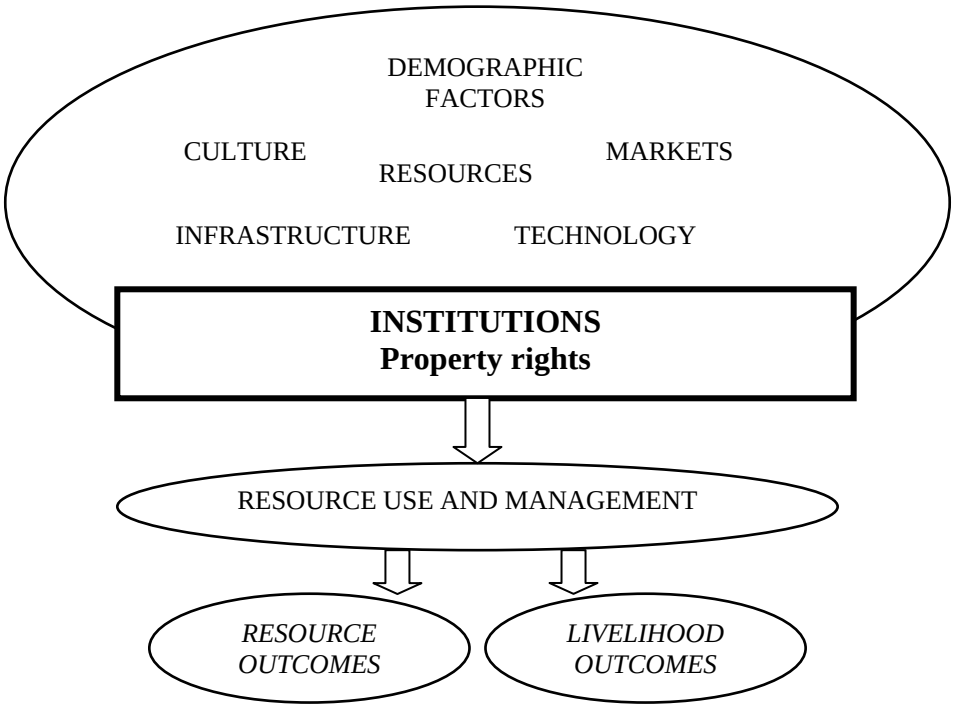


Figure 1. Property rights mediate the effects of demographic factors, culture, markets, infrastructure and technology on resource use and management.

2.3 Resource management regimes

Resource management regimes can be broadly classified into private property, state property and common property regimes and open access. In *private property regimes* the property rights are held by individuals or corporations. Under *state property regimes* the state maintains ownership and control over the resource. Management is usually arranged through government agencies. The state can also allocate and/or lease specific rights to individuals, groups and corporations for a specific amount of time. A *Common property regime* is a form of private property regime, where a group of individuals holds the rights and duties to the resource in common (Bromley 1991). It is a way to privatise the rights to a resource without

dividing it into pieces (McKean and Ostrom 1995). The management authority is held by the group, its leaders or other representatives selected by the group members (Bromley 1991).

Under an *open access regime* there are no property rights and no defined group of users or owners, and the benefit stream is available to anyone. In situations where natural resources have never before been integrated into regulated social systems, the resources are available to the first ones to capture them. Similar situations can also arise when collective or individual management regimes break down (Bromley 1991). Also, situations resembling open access arise when property rights are not enforced and unauthorised or illegal use of the resources becomes possible. This is quite often the case in developing countries where land, and especially forest, is under state ownership. Lack of information concerning the resources and lack of funds and personnel, as well as undeveloped infrastructure, make it impossible to manage large forests areas and control their use. In practice, the lack of control makes these resources open access resources (Baland and Platteau 1996).

According to Hardin's much cited "Tragedy of the commons" (1968), resources that are open to all are doomed to over-exploitation. Resource destruction would result because it would be in the users' private interest to harvest the resource as soon as possible before others do so. Each user imposes an external cost on all other users by reducing the availability of the resource. In the absence of property rights, the externality of future scarcity is not internalised by individual users and the outcome is inefficient, high utilisation. Hardin was clearly describing a situation under open access. However, his article has contributed to the confusion between common property and open access (Bromley 1991, Baland and Platteau 1996, Richards 1997, Arnold 1998). Hardin has later made a distinction between unmanaged commons subject to tragedy and the managed commons where property rights may be able to prevent misuse of the resource (Hardin 1994 referred to in McKean and Ostrom 1995). The "Tragedy of the commons" has had a major influence in shaping the policies related to natural resources management. It has been used to justify both privatisation policies and increasing state control over natural resources (Richards 1997, Arnold 1998).

The proponents of the property rights school base their arguments on the neoclassical economic tradition and tend to see private, individualised, property rights as the best alternative for long term resource conservation and increasing investment. According to Demsetz (1967), the main function of property rights is to internalise the externalities. Property rights emerge when the gains from internalisation become greater than the costs of internalisation. Individual rights develop when the resources under open access face increasing pressure due to population growth or changes in technology or in the markets. Under well-defined individual property rights resources will be transferred to their most effective use. These arguments rest on the conditions of costless enforcement of property rights and the existence of perfect, competitive markets. However, because the costs of transacting are positive, delineating rights and their enforcement are costly, and rights are thus never perfectly delineated (Barzel 1997). Also, in the real world, especially in developing countries, the other theoretical conditions related to perfect and competitive markets are not realised (Baland and Platteau 1996). When markets are incomplete, land markets will not automatically transfer land to more productive uses (Deininger and Feder 1998).

Individual private property regimes have proven to be successful especially in managing agricultural and industrial land (Bromley 1991). Increased land security enhances investment, which usually leads to higher productivity. The transferability of rights can also enhance investments and provide incentives for more efficient use of labour. Individual land rights can

be used as collateral and thus enable access to credit, which is used for further investments (Deininger and Feder 1998).

The allocation of forest land to individual households has been a much less common than the devolution of forest-related rights to local communities. In China, Laos and Vietnam bare or degraded forestland has been contracted or allocated to households. Privatisation or partial privatisation of rights can create incentives for investing in tree planting or support the development of agroforestry systems. In some countries, favourable market conditions and the declining availability of forest products from natural forests have increased tree planting in agricultural lands on small farms. This has been the case for example in the Philippines and Kenya (Bertomeu 2006, Carsan 2007).

In Vietnam, the success of agricultural land allocation in the low land areas encouraged the formulation of forest land allocation policies, which enable partial privatisation of rights to bare or degraded forest land. However, the effects of forest land allocation seem to be very location specific and vary according to the geographic location and natural conditions, which largely determine the production options for farmers. In areas with sufficient amount of land for food production, forest land allocation and contracting has increased forest cover and the quality of the forest. On the other hand, the impacts of forest land allocation have been small or even negative on the livelihoods of resource-poor households who suffer from food shortage (Hanoi Agricultural University 2001). The experiences from Vietnam imply that only better off households, who have a sufficient area of agricultural land for food production can afford to invest in plantations (Castella et al. 2002).

In developing countries, forest resources are quite commonly under a state property regime. This regime has generally been ineffective in protecting the resource and securing its sustainable management. In practice forest resources have often been under de facto open access. To bring the resource under proper management requires that secure property rights are instituted. The discussion over the benefits of individualised private property clearly emphasises the security of rights over land and its implications for investment incentives. Secure rights are often equalised with individualised private property rights (Deininger and Feder 1998). However, secure rights can also be held by a clearly defined group of individuals. This presents a special case of private property regime, private property for a group of co-owners (Bromley 1991). The consideration of equity issues may support a common property regime instead of individual private property. Equity issues are accentuated in developing countries, where natural resources can have a crucial role in the local people's livelihoods (Baland and Platteau 1996). Insufficient alternative livelihood options emphasise the importance of allowing continuous access to and opportunities to benefit from forest resources for a large number of people instead of granting these rights to a small number of individuals.

The discussion on common property regimes is closely related to the management of common-pool resources (Ostrom 1990, McKean 2000). McKean (2000) argues that misjudging the type of goods a resource system provides can lead to the design of management arrangements that do not support sustainable management. Three different types of goods can be distinguished based on the excludability and subtractability of the goods: *private goods*, *common-pool goods* and pure *public goods*.

Excludability refers to how easy it is to exclude others from accessing the resource; in other words, how costly it is to exclude others from benefiting from the resource. If goods used by

someone diminish the amount available for others the goods are subtractible. Private goods are subtractible goods for which exclusion is easy. Pure public goods are non-subtractible and exclusion from accessing the goods is difficult. Common-pool resources are subtractible but the exclusion of others from using and benefiting from the resource can be difficult. Forests, pastures and fisheries are common-pool resources (McKean 2000).

Several issues can favour common property regimes over individualised private property regimes. These issues are closely related to the nature of the resource. Common property regimes provide a way to privatise the rights to a resource without dividing it into individual parcels (McKean and Ostrom 1995, McKean 2000). Common property regimes are thus important for managing resources that need to be managed in large units or are difficult to divide between individuals. Managing a forest for biodiversity and environmental services can require management at a landscape scale. Similarly, the uncertainty concerning the specific location of productive areas within the resource favours management in large units. Movable resources like wildlife, water, fish and air have to be managed in large units. The costs of individualising rights to pastures and forest and the enforcement of the individual rights can also be high. When resource conservation and improvement require long term investments, the costs of these investments can be more easily borne by a community than by individual households. In forestry the investment, protection and management costs can be high. Also, the opportunity costs of growing trees can be very high for individuals favouring other land uses than forestry (McKean and Ostrom 1995, Bruce 1999). Common property regimes provide for the access and use of forest products for the members of the community (Bruce 1999). Privatisation would restrict these rights exclusively to the individuals holding rights to the parcels.

In Asia and Africa, the devolution in natural resource management has generally involved villages and communities. One of the issues that has contributed to the wide popularity of community-based conservation and management has been the rather simplified view of traditional and local communities. They have been seen as rather homogeneous, static groups of resource users, who share common interests and are governed by shared norms and customs. However, in most cases communities consist of subgroups or individuals with different interests regarding the use and management of forest resources (Agrawal and Gibson 1999). Different interests can be based on gender, amount of cultivable land, occupation, ethnicity etc. Quite generally the poorest rely more on forest resources than the relatively richer community members. The poorest can e.g. be more dependent on NTFPs and fuel wood from common resources, or need to use common land for grazing. The better off community members can instead be more interested in the future timber values and can afford to manage forests for timber. The differences in the importance of forest resources in the livelihoods of community members, and the differences in their needs and interest regarding forest resources cause conflicts at the local level.

Experiences from Nepal indicate that the condition of forests under community forestry has generally improved leading to improved availability of forest products (Dev. et al. 2003, Yadav et al. 2003). Community forestry has also increased livelihood opportunities through employment and new income opportunities (Dev et al. 2003). However, several studies have found that community forestry has not always lead to equitable distribution of forest products or improved the poorest community members' access to forest products (Neupane 2003, Adhikari et al. 2004, Adhikari 2005). The reasons for inequitable livelihood outcomes relate to the distribution of power among local actors, inequitable participation, and inequitable skills and capacities to benefit from common resources.

Property rights should create space for finding just and equitable solutions to accommodate different interests and for negotiating widely accepted forest resource management objectives. The legitimacy, representability and accountability of the organisation to which the management powers are devolved are crucial for equitable outcomes. In many cases, these organisations have been accountable to forest authorities rather than the local people (Hobley 2007).

2.4 Property rights as a bundle of rights

In practice, the resource management regimes are very seldom found in the pure and simple forms discussed above. Instead, they consist of a spectrum of regimes from open access to private property (Hanna et al. 1996). In most cases, rights and responsibilities are divided between individuals or groups and the state, and between a group and its members as well as between individuals within a group. Property rights consist of a bundle of different kinds of rights (Schlager and Ostrom 1992). The resulting property right regimes are characterised by the distribution of these right bundles between different actors. The nature and characteristics of the bundles of rights as well their duration and their security affect individuals and groups incentives and actions in relation to resource use and management as well as the outcomes they receive (Pearse 1990, Bruce et al. 1994, Ostrom and Schlager 1996, Lindsay 1998, Deininger 2003).

Property rights consist of access, withdrawal, management, exclusion and transfer rights. *Access rights* define who is authorised to enter the resource and enjoy non-subtractive benefits. They can be subject to paying an entrance fee, as is the case for visitors in a national park. They can also be granted to the residents of a certain geographical area or to members of a specific group (Schlager and Ostrom 1992, Ostrom and Schlager 1996). *Withdrawal rights* define what products of a resource the right holder is authorised to harvest. These rights can specify how and/or when harvesting should be done. They can also relate to the purpose of harvesting: harvesting can be restricted to subsistence purposes and not for sale (Schlager and Ostrom 1992, Ostrom and Schlager 1996).

The comprehensiveness of withdrawal rights refers to the extent of benefits from the resource that the right holder is entitled to. The degree of comprehensiveness affects the economic efficiency of resource management. "If someone has comprehensive property rights over a forest, he can be expected to maximise the value generated by all its attributes and possible uses, compromising one in favour of another whenever it is advantageous to do so" (Pearse 1990). If rights to different products of the resource are held by different entities, they will seek to maximise the benefits to which they are entitled but disregard those which they are not entitled to (Pearse 1990). Comprehensiveness determines the subsistence use and income earning options for the right holders and the distribution of benefits between those holding rights to different forest products and services.

Management rights are the rights to transform the resource by making improvements and regulating the internal use of the resource. Those who hold management rights are entitled to decide on the transformation and development of the resource and to devise withdrawal rights. They can determine how, when and where harvesting can take place and how the structure of the resource may be changed (Schlager and Ostrom 1992, Ostrom and Schlager

1996). Management rights thus establish the options for investing in the development of the resource.

The rights to transform the resource through investment and withdrawal rights are often combined and referred to as the rights to economic benefits from the resource (Pearse 1990, FAO 2001). These rights are usually constrained by governmental restrictions, which relate to the harvesting, utilisation and management of the resource. Regulations also specify the distribution of returns between the right holder and the state through taxes, royalties and other charges.

Forest management is quite generally subject to drawing a management plan that needs authorisation from forest officials (Pearse 1990). Through management plans authorities maintain control over the use of resources and can ensure that wider environmental and social concerns are addressed in the management. Another approach is that the government sets minimum standards for forest management though laws, regulations and guidelines. Rules can e.g. prohibit clear-felling, set the minimum diameter for felling and give instructions on planting. In practice, the requirement for a management plan is often combined with additional rules and regulations.

Exclusion is the principal *right* that differentiates any rights system from an open access regime. Exclusion rights convey the authority to determine who will have access and withdrawal rights (Schlager and Ostrom 1992, Ostrom and Schlager 1996). Exclusion rights determine the extent to which the right holder can exclude others from the resource. "When rights are not exclusive and right holders compete with each other for the same benefits … they are likely to exploit it inefficiently and too fast" (Pearse 1990). Also, right holders do not have incentives to invest in the resource, if they cannot rely on enjoying the future benefits from the resource (Pearse 1990). When exclusion rights are held by an individual or a clearly defined group of users, all others have to respect these rights. An authority system that protects the right holders' interests is especially important for making others respect exclusion rights.

Schlager and Ostrom (1992) define alienation rights as the rights to sell or lease either or both of the rights of management and exclusion. Limiting alienation to sale or lease corresponds with the economic theory, which expects that alienation rights allow for resources to be transferred to their highest value use. By selling the rights to a resource the right holder can also benefit from the potential productive value of the resource and from the investments made in increasing its productivity. Larson and Bromley (1990) have argued that private property resource management regime with the rights of sale and lease and common property regime with the right to bequeath may produce similar resource use. Empirical findings support this argument; including the right to bequeath in the bundle of rights in common property regimes offers incentives for sustaining the resource (Fernandez 2006). In this study, the term *transfer rights* is used to refer to the rights of sale, lease and bequeath access, withdrawal, management and exclusion rights. Different combinations of the above discussed rights define the bundles, which an individual or a group of individuals can hold. The duration of these rights and their security further define the way in which the rights affect resource management and use.

2.5 Duration and security of rights

The duration of rights determines the extent to which the right holder will take into account the future impacts of his actions. The duration of specific property rights and the mechanisms available for extending them affect the incentives to invest in the resource (Deininger and Feder 2002). The duration of the rights defines the right holders' time horizon. To encourage improving the resource or conserving it for future use, the duration should be long enough for the holders to benefit from the full income stream generated by investing in the resource (Place et al. 1994, Lindsay 1998, Deininger 2003).

The duration of the rights needs to be compatible with the production system and income generating options. In developing countries, forest resources are important for local people's livelihoods. Forests provide for subsistence use and for sale fuel wood and other NTFPs such as foods, medicines, fodder, poles and timber. The systems for forest resource management range from purely extractive systems to intensively managed plantations. In extractive systems products are gathered from the wild, and no management operations are taken in the forests. Plantations, on the other hand, are intensively managed. In between these extremes there is a range of intermediate systems with varying degrees of management for enhancing the production of certain or multiple forest products (Belcher et al. 2000).

Sustainable forest management systems should be based on natural ecosystem functions to maintain productivity and sustain reproduction. The harvesting cycle should be adjusted to the bio-physical conditions of the forests as well as to the scale and objectives of management. Even for fast growing tree species it can take a decade before the trees can be harvested. Logging frequency between 20 to 30 years has been introduced as a reasonable cutting cycle in some systems (Montagnini and Jordan 2005). For slow growing trees, a much longer harvesting cycle is needed. In general, the common feature in forest resources management and for enhancing investment in developing these resources is that it involves a long time horizon.

A well-established property rights system provides security to individuals and groups of individuals so that they can be sure that their bundle of rights (access, withdrawal, management, exclusion and alienation rights) is respected by all others today and in the future for as long as the rights specify. They should also be certain that the rights can not be taken away arbitrarily. Secure rights enable individuals to make commitments to one another in order to develop the resource in a sustainable manner (Ostrom and Schlager 1996).

The security of individual private property rights is usually based on land registration and titling. Secure rights can also be based on customary management systems. Formal documentation is not needed when customary resource management and control systems are strong enough to provide security. Many customary common property regimes have successfully managed natural resources without official recognition or even in contradiction of state laws. Increasing economic integration together with improving infrastructure and road networks, increasing commercial pressure, population growth, and competition and conflicts over land and other resources make it increasingly difficult for these regimes to manage resources in a sustainable manner without formal recognition. In addition to securing land and resource rights, formal recognition of existing communal management regimes will re-enforce the role of customary management institutions (Barrow et al. 2002, White 2003).

The source of rights, i.e. whether the rights are based on formal or informal rules, has a profound impact on the security of the rights. Formal rules include the constitution, laws, regulations and administrative decisions. Informal rules are based on culturally derived customs, traditions and codes of behaviour (North 1990). Customary law and local norms can be an important source of rights. They are usually unwritten, but can nonetheless be complex and effective in regulating the use of resources amongst the local users (Ostrom 1990, Wade 1988, Bruce 1999). However, informal rules often lack the authority system that would make all others respect the rights of the right holder. This authority is provided by the state. Local rights to resources can be effective against outside claims only if they are protected by the state through legal recognition. Legal recognition also protects the rights against the state (Ellsworth and White 2004).

There are always situations where rights need to be taken away or restricted. Usually these situations relate to cases where land or resources are needed to fulfil national priorities, e.g. to provide public goods. The conditions under which the rights can be changed or cancelled should be fair and clearly stated, and right holders should be compensated if the rights are withdrawn (Lindsay 1998).

A key requirement for secure rights is the clarity of the rights and clearly defined boundaries of the resource to which the rights apply. Vaguely described rights are virtually meaningless. Clarity should also apply to the responsibilities associated with the rights and to the benefits derived from the resource as well as to the sharing of benefits between the state and the right holders (Lindsay 1998).

Legal recognition of the right holder gives him/her the capacity to hold rights, enter into contracts, collect fees and apply for subsidies and credit (Lindsay 1998). The lack of legal personality can hamper the ability of the right holders to protect their rights. The lack of contract legislation and an underdeveloped court system also severely undermine this ability. State authorities have in some cases overridden contractual agreements made with village organisations and allocated resource rights to third parties without even consulting the affected villages (Eggertz 1996, Hodgdon 2006).

In relation to common property regimes, the group of right holders should have secure rights over the collectively managed resource. In addition, clearly defined criteria for defining who is eligible for group membership are important (McKean and Ostrom 1995). Secure membership of the group needs to be ensured for individual members (Meinzen-Dick et al. 2002).

Accessible, affordable and fair procedures are needed for protecting and enforcing rights, solving local level conflicts and for appealing decisions of government officials (Lindsay 1998). The legal system and its enforcement are in most developing countries underdeveloped. Often local people are not familiar with or cannot afford the legal procedures for seeking justice. At the local level, accessible and affordable conflict resolution can be based on traditional authorities or community/village organisations. However, community organisations can be powerless against outside claims over resources. Because of this, an avenue for seeking protection for the rights against outsiders is necessary. Often this support is provided through the state forest agency, e.g. at the district level. A crucial aspect of conflict resolution is that the arbitrating body should be independent and fair (Ellsworth and White 2004).

In a common property regime, the security of rights is strongly affected by the groups' ability to manage and regulate the use of resources, including the enforcement of the locally drawn rules. The strength, accountability and legitimacy of the community organisations, which are responsible for making rules regarding the use and management of the resource, are crucial for the sustainable use of the resource. Community organisations' inability to represent wide community interests, design equitable rules, enforce the rules, or protect community interests against outsiders creates insecurity and hampers sustainable management efforts.

2.6 Conditions supporting collective action

Collective action has often been defined as "action taken by a group… in pursuit of members' perceived shared interests" (Marshall 1998). It involves a group of people who have shared interests and develop voluntary common action in pursuing these interests (Meinzen-Dick et al. 2004). In a common property regime, property rights and collective action are interrelated. Common property regimes require both clearly defined property rights for the group and collective action within the group (Knox et al. 2002). Property rights define the rights and duties of a group in relation to others, but they do not specify the relationships between the individual members of the group (Sjaastad and Bromley 2000). Collective action within the group is necessary in order to develop rules for the management and use of the resource, i.e. to define the internal relationships between the individual members of the group in relation to the use and management of the resource.

Several factors have been identified as being important in increasing the likelihood for collective action to emerge and prevail. They include attributes that relate to the resource, resources users and to the relationship between users and the resource. The resource characteristics that enhance collective action relate to the returns to the resource and the importance of the resource in the livelihoods of the users, as well as to the size of the resource. Collective action is encouraged when the size of the resource is too large for individual capture but can be monitored by a group of users (Meinzen-Dick and Knox 1999).

Conditions contributing to the emergence of collective action in relation to forest resources can also include a growing shortage of forest products or services, increasing outside interests to use the resource and changing government policies that create new needs and opportunities to reassert local control over resources (Arnold 1998). On the other hand, the resource should not be so degraded that it would be considered useless to organise for improving it (Ostrom 1999). Users should also have long time horizons and a relatively low discount rate for future benefits from the resource. Previous experiences of cooperation within a group can enhance collective action in natural resources management (Meinzen-Dick and Knox 1999). The users should also have common interests in relation to the resource and share "a common understanding of their situation" (Ostrom 1999).

Robert Wade (1988) and Elinor Ostrom (1990) have studied the elements and conditions that contribute to the likelihood of successful collective action. By successful collective action they refer to success in sustaining the resource and gaining compliance to the rules regulating resource use.

Wade (1988) studied 31 villages in Southern India in order to explain the variation in collective action regarding resource management between the villages. He concluded that the likelihood of successful organisation depends on the resources, exclusion technology and the

ease of detection of rule-breaking, the relationship between resource and user group, and the relationship between the users and the state. The chances for developing successful collective action are greater when:

- The resource is small and the boundaries of the resource are clearly defined;
- The costs of exclusion are high;
- The users live close to the resource and the resource is important for their survival;
- Users have knowledge of the sustainable yields from the resource;
- The user group is relatively small and clearly defined;
- There are arrangements for discussing common problems within the group, and rules exist for other purposes and there are punishments against rule-breaking;
- It is easy to detect rule-breaking;
- Mutual obligations and social reputation matter to the users; and
- The state authority does not undermine local authorities.

Ostrom (1990) analysed long lasting institutional designs for mountain grazing and forest management in Switzerland and Japan and irrigation systems in Spain and the Philippines. She identified conditions that were important for the success of these institutions in sustaining the resource and gaining users' compliance with the rules in use. For robust, long lasting institutions most of these conditions were fulfilled, but for institutions that failed very few were fulfilled. The following conditions were related to the success of the institutions for managing common pool resources (Ostrom 1990, 1999):

- Both the boundaries of the resource and the individuals and households who have rights to benefit from the resource must be clearly defined.
- Concurrence between the rules that restrict the time, location, technology and quantity of resource units harvested and the rules that relate to the labour, materials or money resource users are required to contribute. These rules define the benefits and costs for resource users. The benefits should be proportionate to the costs involved. Also the rules covering the distribution of costs and benefits need to be perceived as being fair.
- Existence of collective choice arrangements through which most users affected by the rules can participate in designing and modifying rules.
- Users or monitors accountable to the users, monitor the condition of the resource and the behaviour of the resource users.
- Enforceable sanctions for rule violations. Sanctions should be graduated to correspond with the seriousness and context of the violation.
- Existence of low-cost, local, conflict resolution mechanisms.
- Government authorities recognise, or do not challenge, the institutions governing resources and the legitimacy of the rules drawn by them.
- For the management of more complex common-pool resources that are parts of larger systems, all activities are organised in multiple nested levels. These activity levels are nested in local, regional and national governance structures.

The above mentioned conditions "affect incentives in such a way that appropriators will be willing to commit themselves to conform to operational rules devised in such systems, to monitor each other's performance, and to replicate the common-pool resource institutions across generational boundaries" (Ostrom 1990).

There is a wide consensus regarding the factors that facilitate collective action, except in relation to the size and homogeneity of the user group. Small size and homogeneity of the

user group have often been mentioned as conditions that facilitate the emergence of collective action leading to some form of organisation for resource management. However, in some cases smaller groups can find it more difficult to initiate and maintain collective action (Agrawal 2000). Poteete and Ostrom (2004) provide an overview of the research addressing group size and heterogeneity/homogeneity of the group and collective action. They conclude that how the size and heterogeneity of the user group affect collective action is contextually driven and mediated by institutional arrangements. While for small homogeneous groups it can be easier to build collective action, larger groups can draw from a wider resource base and can thus be able to invest more in developing and protecting the resource. Because of the great variety in social, cultural and biophysical conditions the rules that facilitate collective action need to be adjusted to the local circumstances.

2.7 Analytic frame

On the basis of the preceding theoretical discussion on property rights and collective action, it can be concluded that the most important attributes of property rights are use (access and withdrawal), management, exclusion and transfer rights as well as the security and duration of the rights. The different attributes are considered equally important. The options and opportunities to benefit from the resources and the incentives for sustainable resource management are shaped by the combination of the different attributes of rights (Figure 2).

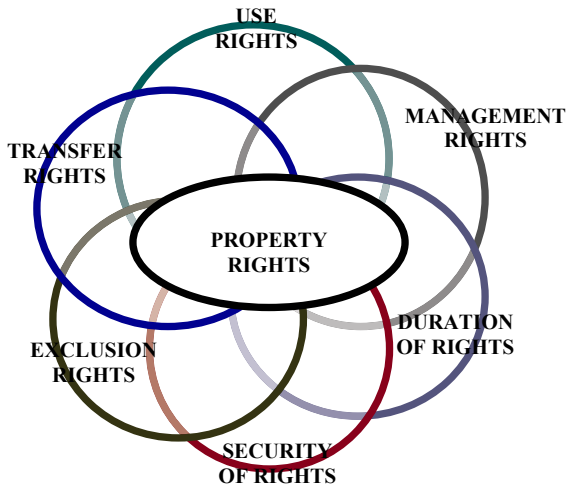


Figure 2. The key attributes of property rights.

Even though property rights and collective action are theoretically distinct concepts, some issues which are essential for the security of rights also enhance successful collective action (Meinzen-Dick et al. 2002). These issues include clearly defined boundaries of the resource to which the rights apply, clearly defined right holders, and the existence of conflict resolution mechanisms. Other aspects enhancing successful local level management relate to the scope of rights the users have, i.e. to their rights to design and modify rules covering the use and

management of the resource, to the external recognition of the rights and to the enforcement of the rights and rules. In addition, collective action should provide benefits in excess of the costs of organising. Property rights must thus provide for sufficient benefits to cover the organising costs and the investments in the resource as well as the costs of everyday management of the resource.

The property rights system should provide an enabling environment for sustainable forest management. It should be secure, but flexible, and leave enough free-way for local people to create a resource management system that is well adapted to the local natural, social and cultural circumstances. It should respond to local needs and interests, and it should allow for continuous development and modification in order to adjust to changing circumstances. Forest resources, local people's needs regarding forest products, and their use of forests can vary considerably between locations. The degree to which management rights are devolved to the local level determines how resource management can be adjusted to local circumstances. Devolving management rights to local users enables adjusting resource management to incorporate local needs, capacities and resource characteristics. Devolution can also support the integration of local knowledge and traditional management practices into the management of forest resources through incorporating local resource users into management planning and implementation (Simpler Forest Management… 2004).

In conclusion, the theory and empirical evidence indicate that in addition to focusing on the contents of the rights it is also important to consider to what extent the different attributes of rights are devolved to the local level. The extent of the devolved rights can be addressed by analysing the comprehensiveness of use rights (access and withdrawal rights), the extent of management rights, the extent of the rights to exclude others from the resource and the extent of rights to transfer these rights through inheritance, sale or lease as well as the duration and security of the rights. The legal framework on which the devolution is based should address the different attributes of rights and enable the transfer of rights to the local level. In an ideal case, the legal framework should enable the devolution of secure, long term, comprehensive use rights, extensive management rights, rights to exclude others and rights to transfer these rights. The ideal type is defined on the basis of the theoretical and empirical knowledge for analytical purposes to structure the analysis. It represents a measure against which the cases can be assessed. It should not be taken to mean that the best way to enhance sustainable forest management and improve the livelihoods of forest dependent people would always be to devolve unrestricted rights to the local level. However, the devolution of rights is seen as one of the most important elements in the development of a framework, which would enhance these goals. Other important issues include the nature of the local level organisations to which rights are devolved and the ability of these organisations to represent different local interests and manage forests.

3 MATERIALS AND METHODS

3.1 Case study strategy

The methodology of this study is based on comparative case study research, fuzzy set theory and Qualitative Comparative Analysis method (QCA) (Ragin 1987, 2000, Yin 1994). The method rests on the analysis and comparison of multiple case studies.

According to Yin (1994), the choice between different research strategies should be based on the type of research questions asked. Case study strategy is favoured when a research focuses on "how" or "why" questions in situations related to contemporary events which are outside the researcher's control (Yin 1994). The main emphasis of this study is on how and to what extent the forest-related rights have been devolved to local communities and/or households. The descriptive and exploratory nature of the research clearly favours the use of case study strategy.

In comparative research, the interest is in the diversity within the cases, i.e. in the similarities and differences across the cases (Ragin 1994). The analyses were based on comprehensive understanding of the devolution in the study countries and on the detailed descriptions and analyses of the cases. This restricted the number of countries that could be included in the study. On the other hand, the relatively small number of study countries should represent as much variety as possible regarding the devolution of forest-related rights. The study countries were chosen from East Africa and South and Southeast Asia. Six countries from these regions were selected: Lao People's Democratic Republic (Laos), Nepal, Vietnam, Kenya, Mozambique and the United Republic of Tanzania (Tanzania[2]). General background information on the selected study countries as well as information on the forest areas, deforestation rates and forest ownership are presented in Appendix 1.

In line with the global forest ownership structure, forests in these regions are quite generally under public ownership. Within the countries in these regions, the devolution of forest-related rights is based on very different legal frameworks and approaches, which have been in effect for various lengths of time. In most countries rights are devolved to villages (as an administrative unit) or different community-based organisations. In Laos and Vietnam, forestland is also allocated to households. The study countries were chosen so that they would represent variation regarding the right holders and include countries with a relative long term experience from devolution as well as countries with very recently established legal frameworks for devolution. In Nepal, the framework has been in place for more than a decade. In Kenya, the Forest Act which enables community participation in forest management was enacted in 2005. However, within each selected country the framework for the devolution of forest-related rights is homogenously applied across the country. Differences in forest cover and deforestation rates were also considered when choosing the countries. Vietnam represents a country, where the forest area has increased during the previous decade (FAO 2007b).

A crucial issue in case study research is the definition of a case, which in case study research is the principal unit of analysis. The definition of the case determines the limits of data collection and analysis (Yin 1994). In this study the interest is in the national level frameworks, which guide the devolution of forest-related rights to the local level. Through

[2] For practical reasons Lao People's Democratic Republic and United Republic of Tanzania are in the text referred to as Laos and Tanzania.

devolution local communities and/or households are to varying degrees and ways authorised to use and manage forests. In some countries to legal frameworks clearly establish two or even three different ways for devolving forest-related rights. The cases in this study represent the main ways used for devolving forest-related rights either to communities or to households in the study countries. Altogether eleven cases of devolution were distinguished within the six study countries.

The theoretical framework guides the identification of those characteristics of the case studies, which are considered important for the interest of the study. The analytical frame also defines the framework for data collection and analysis. The study is based on the analysis of the legal documents of each country, concentrating on the laws, regulations and guidelines that currently (in 2007) define the extent and contents of the forest-related rights and form the framework for devolving these rights to the local level. The main legal documents related to the devolution of rights to forests in each study country are listed in Appendix 2. Scientific research, policy and legal analyses and reports related to land and forest rights in the study countries formed also an important part of the material. They were used to develop comprehensive understanding of the devolution policies and their implementation in each country.

3.2 Fuzzy sets, Qualitative Comparative Analysis and the ideal type

The Qualitative Comparative Analysis (QCA) method was developed by Charles Ragin (1987) to formalise a technique for qualitative, holistic comparisons. The similarities and differences between the cases can be analysed by comparing them as configurations of attributes (set memberships). The original version of QCA was founded on Boolean algebra. In Boolean algebra, a case is either in or out of a crisp set. A crisp set is dichotomous, 1 indicating full membership in a set and 0 indicating full non-membership. A fuzzy set allows for partial memberships between full membership and full non-membership. It consists of two qualitative states: full membership and full non-membership and quantitative variation between these states. It allows for assessing the degree of membership in a set (Ragin 2000). The emphasis on the combinations of attributes contrasts these methods with variable oriented research strategies that view the different aspects of cases as analytically separable features. The computerised application of the QCA was first developed by Drass (1992). It has since then been extended and improved. The latest version, which includes fuzzy set analysis, was developed by Ragin et al. (2006).

Both QCA and fuzzy set theory can be used in analysing the diversity within the cases by viewing the cases as wholes that are constructed of combinations of attributes. The interest is on how different attributes combine in each case. Different configurations of attributes can be understood as different types of cases, and a single difference between cases may represent a difference in kind (Ragin 2000). The relationship between theory and evidence has an important role in constructing crisp sets and fuzzy sets. The identification of the relevant attributes of the phenomena under investigation is based on an intensive dialog between theoretical concepts and case study evidence (Ragin 1987). Fuzzy set approach makes it possible to conduct theoretically informed analysis of the diversity between cases and allows comparing the cases according to common criteria.

Fuzzy sets enable to establish a close correspondence between theoretical concepts and propositions and evidence. Theoretically relevant concepts are operationalised through fuzzy

sets. After the relevant attributes have been defined, the construction of a fuzzy set consists of the identification of the empirical indicators and the calibration of the sets. This includes the establishment of criteria for full membership, full non-membership and partial memberships. Fuzzy set membership scores correspond to the degree to which the cases belong to a certain set that is defined as a qualitative state (Ragin 2005).

Fuzzy sets can be defined and calibrated in different ways. Research interests, theoretical framework and the relevant concepts, and the nature and quality of data affect the definition and construction of fuzzy sets. A simple fuzzy set uses three-value logic that allows cases to have full membership (1), full non-membership (0) and partial membership (0.5). Five-value fuzzy set uses five numerical values: 1 (fully in), 0.75 (more in than out), 0.5 (cross-over point, either in or out), 0.25 (more out than in) and 0 (fully out). More fine graded fuzzy sets include seven-value and nine-value sets and continuous fuzzy set. Continuous sets use cross over-point to distinguish cases that are more in than out of a set, but cases can have any values between the full membership and full non-membership. Crisp sets can be included in a fuzzy set analysis (Ragin 2007).

The most common operations on fuzzy sets include: "logical and" (marked with *), "logical or" (marked with +) and "negation" (marked with ~). Compound sets can be formed by bringing together two or more sets. When combined by "logical and" the membership scores in the combined set are the minimum membership scores of each case in the sets that are combined. For example, if the membership scores for a case in set A is 0.25 and in set B 0.5, its score in the combined set A and B is 0.25. When sets are joined by "logical or", the scores for the combined set are the maximum of each case's membership scores in the original sets (Ragin 2000).

In crisp sets, the negation of full membership (1) is full non-membership (0). In fuzzy sets, the negation of fuzzy membership in set A (not A, marked as ~A or a) is calculated by subtracting this membership from one, i.e. ~A = 1-A. E.g., if the membership score for a case in the hypothetical set D "democratic country" is 0.75, its membership in the set d "not democratic country" is 0.25 (Ragin 2000).

With QCA the combinations of crisp set memberships can be compared across cases. QCA can be used either for causal analysis or for constructing empirical typologies. In causal analysis, the focus is on the combinations of attributes that produce a certain outcome. The outcome is coded 1 (present) or 0 (absent). When QCA is used for grouping cases, the interest is not on the outcome, which is coded 1 (present) for all cases. Instead the focus is on the different combinations of attributes represented by the cases. QCA examines different combinations of attributes across cases and produces a logically minimal statement that describes their diversity (Ragin 1987).

For developing an empirical typology of the cases, fuzzy sets are converted into a crisp truth table. The procedure is described by Ragin (2005, 2007) and included in the fs/QCA programme (Ragin et al. 2006). It is based on the construction of a truth table that lists all the logically possible combinations of the relevant attributes (i.e. the logically possible different configurations). This table represents attribute space[3]. Each location within the attribute space can represent a potentially different kind of case. With the fuzzy set approach the attribute space becomes a multi-dimensional vector space that has as many dimensions as fuzzy sets.

[3] Instead of the term "property space" introduced by Lazarsfeld (1937 referred to in Ragin 2000) and also used by Ragin (2000), the term "attribute space" is used in this study for the sake of clarity.

The corners of this vector space represent the crisp set attribute space and correspond to the crisp truth table rows. The attribute space has 2^A corners where A is the number of attributes. The corners represent the logically possible combinations of full membership and full non-membership in the different sets. Cases are located within this attribute space according to their membership scores, which position them along each dimension (Figure 3). Fuzzy sets allow for partial memberships between full memberships and full non-memberships, and cases can be located anywhere within the space defined by the attributes.

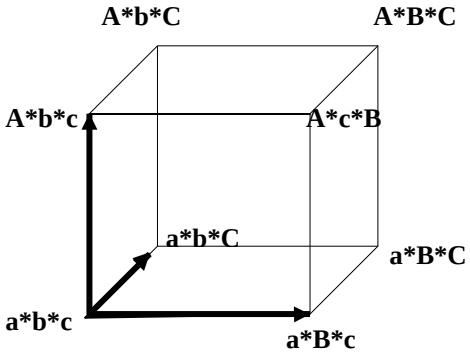


Figure 3. An attribute space defined with three attributes forms a three dimensional space where the corners represent crisp set locations with the logically different combinations of either full membership (A,B,C) or full non-membership (a,b,c).

The cases can be sorted based on their degree of membership in each corner. When a case's membership score in a specific corner is greater than 0.5 it indicates that it is closest to that corner in the vector space. An important feature of the combined fuzzy sets is that each case can only have one combined membership score greater than 0.5. After the cases have been sorted according to which corner they are closest to, the researcher needs to decide, which combinations of attributes are relevant. This is done on the basis of the number of cases with a membership greater than 0.5 in each corner. With a very large number of cases the threshold number can be greater than one. However, when the number of cases is small, as in this study, all combinations of attributes that are represented by cases should be included (Ragin 2005, 2007).

If fuzzy sets were used for causal analysis, the next step would be to assess the consistency of each combination of attributes with the outcome. This is done to distinguish those combinations of attributes, which are sub-sets of the outcome. If a membership score of combined fuzzy set is less than or equal to the membership score in the outcome, the combined set is a sub-set of the outcome (Ragin 2005, 2007). When fuzzy set analysis is used for grouping the cases, all existing attribute combinations are consistent with the outcome, because the outcome is coded as 1 for all cases and the combined fuzzy set scores are always less than equal to 1.

After fuzzy sets have been transformed to a crisp set truth table, the truth table can be minimised to find the different combinations of attributes (conditions), which produce a certain outcome (causal analysis) or to find a minimal number of combinations to describe the diversity of the cases (grouping).

The minimisation is based on the following principles (Ragin 1987):

1) If two Boolean statements that produce the same outcome differ only in one attribute, this attribute can be regarded as irrelevant, and a new, simpler, combined statement can be formed. E.g. if statements Abc and ABc produce the same outcome (Abc+ABc=1), they can be combined to Ac, because B/b is not relevant for the outcome. The new statements are called "prime implicants". Often prime implicants cover several of the original statements.
2) In the second step, the purpose is to find the smallest possible number of prime implicants to cover all the original statements. This is based on the concept of implication. A Boolean statement implies another when the second is a sub-set of the first (Abc is a sub-set of A, thus A implies Abc). The prime implicants are compared with the original statements. E.g. if the original terms based on the truth table are ABC, AbC, ABc and aBc, and the prime implicants AC, AB and Bc, it can be concluded that the prime implicant AB is not needed to cover the originals, because the terms AC (covers ABC and AbC) and Bc (covers ABc and aBc) cover them all.

The fs/QCA 2.0 (WINDOWS program for crisp and fuzzy sets, Ragin et al. 2006) programme includes the method for transferring fuzzy sets to crisp set truth table and minimising the truth table as described above. It uses the Quine-McCulsky algorithm to minimise the truth table.

Fuzzy sets enable the analysis of the cases against a common criterion, which is defined as a specific location in the attribute space. Fuzzy sets can thus also be used to analyse the cases against an analytical construct the ideal type. The ideal type corresponds to the ideal type concept introduced by Max Weber. According to Weber, the ideal type should capture the essential elements of a social phenomenon. It is a conceptual tool against which an empirical phenomenon can be analysed to find out to what extent the empirical phenomenon is similar to or different from the theoretical ideal type (Swedberg 2005). The ideal type is formulated on the basis of theoretical discussion and defined as a specific combination of crisp memberships. It provides a means for comparison, a predefined measure, to which the cases can be compared.

When the ideal type is defined as a specific crisp set location in the attribute space, it is also one of the possible types in the development of an empirical typology with QCA. This is based on the way the QCA sorts the cases to different crisp set locations according to which corner they are closest to. If some cases are closest to the corner that defines the ideal type, they will represent the ideal type also in the typology.

QCA has been widely used in social science research. The Compasss Small-n International Research site's (Compasss 2006) bibliographical database lists over three hundred applications of the QCA method. The majority of this research is in the fields of political science and sociology. Fuzzy set applications in the database totalled 77 (in 2006). Fuzzy set approach has been used for example to assess employee representation in corporate governance (Jackson 2005), consolidation of democracy (Schneider and Wagemann 2006), minimum income protection (Nelson 2004) and to assess the origins of corporate social

responsibility (Gjølberg 2007). Kvist (1999) has analysed welfare reform in the Nordic countries by using fuzzy set theory to assess conformity to ideal types.

QCA has been used in some forest policy related studies. Rudel and Roper (1996) have used QCA to analyse regional patterns and historical trends in deforestation in the tropics. Hyttinen et al. (2000) have employed QCA to analyse the challenges in forest sector's contribution to local development and Ottisch and Weiss (2000) in comparing European mountain forest policies. Statz (2000) has used QCA to analyse how decision makers perceive the potential benefits from non-timber forest products. Hellström (2001) has introduced a hermeneutic approach to QCA in analysing environmental conflicts in forestry.

According to the author's knowledge, fuzzy set theory has not previously been used in forestry or property rights related research. Fuzzy sets and QCA offer fruitful approaches for analysing devolved rights. Because of the limited number of cases and fully qualitative case study evidence, quantitative analysis is not possible. The fuzzy sets provide a way for categorising the case study evidence according to common criteria. In addition to analysing the different attributes of rights, the focus in this study is on how the different attributes of rights combine in each case and how the combinations of attributes are similar to or differ from the theoretical ideal type. The fuzzy set theory and QCA enable a holistic view of the cases and allow analysing the cases as combinations of attributes. The use of QCA for developing an empirical typology on the basis of the case study evidence offers a useful method for synthesising the diversity between the cases and uncovering the main types of devolution represented by the cases.

3.3 Phases of the analytical process

In this study, the fuzzy sets are used to analyse and categorise case study evidence to assess the extent and contents of the devolved rights. The fuzzy set analyses are then used as the basis for developing an empirical typology and in comparing the cases against the theoretical ideal type.

The analytical process consists of the following main phases:

1) Identification of the attributes considered relevant for the phenomena under investigation (defining the attribute space). This is based on theory and previous empirical knowledge (Chapter 2).
2) Specification of fuzzy sets, i.e. the specification of the principles used to translate case study information to fuzzy membership scores and respective verbal qualifiers (Chapter 3.4).
3) Describing the devolution in the forestry sectors in each study country and defining the cases. Writing case study descriptions focusing on the relevant attributes of property rights identified in phase two (Chapter 4).
4) Scoring of cases to assess their memberships in each set, i.e. in relation to each attribute (Chapter 4).
5) Fuzzy set analyses and the development of an empirical typology (Chapters 5.1 and 5.2).

6) Specification of the ideal type. The ideal type forms common criteria against which the cases are compared. The definition of the ideal type is based on theory and previous empirical knowledge (Chapter 5.3).
7) Assessing each case's conformity to the ideal type (Chapter 5.3).

3.4 Definition of fuzzy sets and empirical indicators for scoring the cases

3.4.1 Definition of fuzzy sets

Based on the theoretical framework, the essential attributes of property rights are use rights (access and withdrawal), management rights, exclusion rights and transfer rights, and the duration and security of these rights (Figure 2). To assess the nature and extent of rights that are devolved to the local actors, the cases are analysed by assessing their memberships in sets formed on the basis of these attributes. Some of the fuzzy sets are combined from fuzzy sub-sets. The sub-sets are formed on the basis of the theoretical and empirical knowledge on the different aspects considered important for the set.

The scoring of the cases is based on the case study descriptions. The relevant parts of the text, on which the scoring is based, are marked with codes listed below (Table 2). The same codes are used throughout the text and in the fuzzy set analyses. Instead of a single sentence, the scoring is often based on the overall situation described in the case study.

Table 2. List of codes used in the case study descriptions and analyses:

Code	Meaning
USE	Use rights
USE_{NTFP}	Use rights to NTFPs
USE_T	Use rights to timber
MAN	Management rights
MAN_M	Rights to decide on the harvesting, management and transformation of the resource
MAN_E	Rights to enforce rules, monitor resource use and sanction violators
EXC	Exclusion rights
TRA	Transfer rights
TRA_{HH}	Transfer rights for households
TRA_C	Transfer rights for communities
DUR	Duration of rights
SEC	Security of rights
SEC_O	Origin of rights
SEC_B	Clarity of the boundaries of the area where the rights apply
SEC_H	Clarity of the rights holder
SEC_C	Right to receive compensation if the rights are either fully or partly taken away

The qualitative nature of the case study information does not allow the use of very fine graded sets. Also, with a relatively small number of diverse cases, fine graded sets would make the development of an empirical typology difficult. With more fine graded sets, the diversity between cases would be likely to grow, and with a small number of quite diverse cases and a

relatively high number of attributes, the minimisation of the truth table would not be likely to provide a meaningful solution for developing an empirical typology. On the other hand, in order to transfer fuzzy set membership scores to a crisp set truth table, the scoring of cases has to be done avoiding the use of the score of 0.5. This is because cases, which have a score of 0.5 (the cross over point, where the case is either in, or out) in some attribute(s) cannot be located closest to any crisp set location.

The theoretical framework (Chapter 2) guided the definition of the different attributes of rights and their calibration. However, during the case study analysis the definitions and their scoring were modified and adjusted to better fit the case study information and to develop a meaningful calibration. After experimenting with several different five and four value sets, the four value set using values 1, 0.67, 0.33 and 0 was found to be best for analysing and grouping the cases. The principles used for transferring case study information to fuzzy membership scores are presented below.

3.4.2 Use rights

Use rights consist of both access and withdrawal rights. Use rights encompass the rights related to NTFPs, timber and non-extractive uses of forest resources. Non-subtractive uses, like access to sacred forests, can be very important to local people. However, in the study countries the formal regulatory frameworks concentrate mainly on regulating the harvesting of subtractive goods. Non-extractive uses are not included in the scoring of use rights in this study.

Full use rights to NTFPs and timber include both subsistence and commercial uses. In practice, there is a clear differentiation between the rights to subsistence and commercial use of forest products. The fuzzy set for use rights (USE) is a combination of the sub-sets for the use rights to NTFPs (USE_{NTFP}) and use rights to timber (USE_T), i.e. $USE=USE_{NTFP} * USE_T$ (Tables 3 and 4).

Table 3. Principles for scoring memberships in the sub-set of use rights to NTFPs (USE_{NTFP}),

Content of rights	Membership score	Verbal label
Subsistence and commercial use	1	Comprehensive rights
Subsistence and restricted commercial use	0.67	Rather comprehensive rights
Subsistence use	0.33	Rather restricted rights
Restricted subsistence use	0	Restricted rights

Table 4. Principles for scoring memberships in the sub-set of use rights to timber (USE_T).

Content of rights	Membership score	Verbal label
Subsistence and commercial use	1	Comprehensive rights
Subsistence and restricted commercial use	0.67	Rather comprehensive rights
Subsistence use	0.33	Rather restricted rights
Restricted subsistence use	0	Restricted rights

3.4.3 Management rights

Management rights define the right holders' powers to decide on the management, development and harvesting of the resource, as well as the powers to monitor the resource condition and resource use. They include the ability to decide on the resource management objectives.

Forest management objectives can be defined when forest lands are categorised during land use planning. The general categorisation of land, for example into protection and production forests, determines the general management objectives and often limits the choice of management objectives at the community level. The participation of local people in the local level land use planning processes defines their ability to influence the objectives of land management and use.

Often forest management objectives are decided during the forest management planning process. The management objectives, activities and harvesting of forest products are regulated through a management plan. Management plans are usually made for five to ten years. Short term operational plans are normally prepared for each year. They describe the concrete harvesting, management and development actions to be taken. Right holders' ability to participate in the management planning processes and their ability to influence the contents of these plans indicate the extent to which these rights are held at the local level.

The management planning process and the process for drawing local rules regarding the use and management of resources are often closely connected. Forest management prescriptions described in the management plans are often addressed or complemented by concrete rules (or by-laws), which describe community members' (and others') rights and obligations in relation to forest resources. The right holders' power to enforce these rules including the rights to monitor resource use, and to sanction those who violate the rules is an important element of management rights.

The fuzzy set of management rights (MAN) is a combined set consisting of two sub-sets. These sub-sets relate to the extent of rights to 1) decide on harvesting, management and transformation of the resource (MAN_M) and 2) enforce rules, monitor resource use and sanction violators (MAN_E). Thus $MAN=MAN_M * MAN_E$ (Tables 5 and 6)

Table 5. Principles for scoring memberships in the sub-set of rights to decide on the harvesting, management and transformation of the resource (MAN_M).

Contents of rights	Membership score	Verbal label
Right holder makes decisions related to the harvesting, management and development of the resource	1	Extensive rights
Right holder shares this right with others but has an important role in the decision making	0.67	Rather extensive rights
Right holder participates in the decision making	0.33	Rather restricted rights
Right holder's role is limited	0	Restricted rights

Table 6. Principles for scoring memberships in the sub-set of rights to enforce rules, monitor resource use and sanction violators (MAN_E).

Contents of rights	Membership score	Verbal label
Right holder has the right to enforce rules, monitor use and sanction violators	1	Extensive rights
Right holder shares this right with others but has an important role	0.67	Rather extensive rights
Right holder participates in rule enforcement, monitoring and sanctioning	0.33	Rather restricted rights
Right holder has a limited role in rule enforcement, monitoring and sanctioning	0	Restricted rights

This last sub-set is not relevant in cases, where rights are devolved to individual households. The fuzzy membership scores for these cases are coded as missing.

3.4.4 Exclusion rights

Exclusion rights define right holders' ability to exclude others from using the resource. They are the principal rights to distinguish any resource management regime from open access. Exclusion rights include the right holders' powers to exclude outsiders and local users from accessing and using the resource. Outsiders refer here to individuals and companies that seek to exploit resources for commercial purposes. Quite generally, commercial utilisation requires authorisation from a state authority. When right holders have the right to participate in the decision making regarding the allocation of rights to others, the membership score in the fuzzy set of exclusion rights is 0.33. Exclusion rights range from full (1) to no rights to exclude others (0) (Table 7).

Table 7. Principles for scoring memberships in the set of exclusion rights (EXC).

Contents of rights	Membership score	Verbal label
Right holder has full rights to exclude all others	1	Extensive exclusion rights
Right holder has an important role in the decision making regarding the allocation of rights to outsiders	0.67	Rather extensive exclusion rights
Right holder participates in the decision making regarding the allocation of rights	0.33	Rather restricted exclusion rights
Right holder has limited rights to participate in the decision making regarding the allocation of rights to outsiders	0	Restricted exclusion rights

3.4.5 Transfer rights

Extensive transfer rights for households (TRA_{HH}) include the rights to sell, lease and bequeath (Table 8). Transfer rights for communities and villages (TRA_C) are generally more restricted; members are not allowed to sell or lease. However, as noted in Chapter 2.4, the right to bequeath offers incentives for sustaining the resource in common property regimes. For community groups, this fuzzy set is thus a crisp set consisting of cases, which are either fully

in (with right to bequeath, membership score 1) or fully out (without right to bequeath, membership score 0) of the sub-set of transfer rights for communities. When the right holder is a village or community group and the membership is subject to living within the village/community, villagers' children are implicitly entitled to the rights. The membership score in these cases is thus 1. In cases where transfer rights are unclear, they are coded 0. The set of transfer rights (TRA) consist of the sub-sets of transfer rights for households (TRA_{HH}) or transfer rights to communities (TRA_C). Thus $TRA = TRA_{HH} + TRA_C$.

Table 8. Principles for scoring memberships in the sub-set of transfer rights for households (TRA_{HH}).

Contents of rights	Membership score	Verbal label
Full rights to transfer, including full rights to sell, lease, bequeath and use as collateral	1	Extensive transfer rights
Restricted rights to sell and use as collateral, rights to bequeath	0.67	Rather extensive transfer rights
Rights to bequeath	0.33	Rather restricted transfer rights
No transfer rights	0	No transfer rights

3.4.6 Duration of rights

The duration of rights defines how long the use, management, exclusion and transfer rights are valid. The membership in this fuzzy set is calibrated according to the case study information and the nature of forest production, which in the case of timber production (in natural forest) typically involves a long time horizon (Table 9). When rights are based on contracts made for a specific term, the initial contract term is used as the basis for scoring the duration of rights. In many cases contracts can be renewed. However, renewal process can be expensive and cumbersome for local communities. They can also give authorities opportunities to exercise power and control over the resources. There are no guarantees that the contract terms will not be altered. This can affect the right holders' time horizon. Based on these considerations, the duration of the rights is scored according to the initial contract term regardless of the options to renew or extend the contract.

Table 9. Principles for scoring memberships in the set of duration of rights (DUR).

Duration of rights	Membership score	Verbal label
Over 70 years	1	Rights are held perpetually
21 to 70 years	0.67	Rather long term rights
4 to 20 years	0.33	Rather short term rights
1 to 3 years	0	Very short term rights

3.4.7 Security of rights

The fuzzy set for security of rights consists of four sub-sets. They are (1) the origin of rights (SEC_O), (2) the clarity of the boundaries of the area, where the rights apply (SEC_B), (3) the clarity of the right holder (SEC_H), and (4) the ability to receive compensation if the rights are either fully or partly taken away (SEC_C). The fuzzy-set for security can thus be defined as $SEC=SEC_O*SEC_B*SEC_H*SEC_C$ (Tables 10 and 11).

Table 10. Principles for scoring memberships in the sub-set for the origin of rights (SEC_O).

Origin of rights	Membership score	Verbal label
Title or certificate as an indication of state recognition of rights	1	Secure rights
Rights are based on law, formal contract or formally recognised customary rights	0.67	Rather secure rights
Unrecognised customary rights	0.33	Rather insecure rights
No foundation for rights	0	Insecure rights

The sub-set for the clarity of boundaries (SEC_B) is a crisp set consisting of cases, which are either fully in (1), when the boundaries of the area, where the rights apply are clearly defined, or fully out (0), when the boundaries are not clearly defined. Membership score 1 corresponds with the verbal label of secure rights and membership score 0 with insecure rights.

Table 11. Principles for scoring memberships in the sub-set for the clarity of right holder (SEC_H).

Clarity of right holder	Membership score	Verbal label
Right holder is clearly defined and has a clear legal status	1	Secure rights
Right holder is clearly defined but is not a legal entity	0.67	Rather secure rights
Right holder is unclearly defined	0.33	Rather insecure
Right holder is not defined	0	Insecure rights

The fuzzy sub-set for the right to receive compensation, if the rights are partly or fully cancelled or withdrawn (SEC_C) is a crisp set. Cases are either fully in (1), when right holder receives compensation in the case the rights are either fully or partially withdrawn for reasons other than right holders' own actions, or fully out (0), when no compensation is granted. The membership score is 0 also in those cases, where compensation issues are not addressed in the legal framework. Membership score 1 corresponds with the verbal label of secure rights and membership score 0 with insecure rights.

4 CASE STUDIES

4.1 Laos

4.1.1 The role of devolution in forest policy in Laos

The Forest Strategy 2020 recognises that forests have an important role in local livelihood systems. In the upland areas the strategy aims at, for example, linking rehabilitation, conservation and the expansion of forest cover with meeting the needs for food and commodity production. It also aims at decreasing the amount of land used for shifting cultivation. The implementation principles of the strategy include the development of village based natural resources management and the promotion of sustainable participatory NTFP management and processing. The strategy targets to complete the land-forest allocation programme by 2020 (MAF 2005).

The National Land Use Planning and Land Allocation Programme (LUP/LA) is an important part of the rural development strategy. It forms the basis for enhancing rural people's participation in forest management. The objectives of this programme are sustainable management and use of natural resources, reduction and gradual elimination of shifting cultivation, and promotion of commercial production. The programme supports the government policy to consolidate and relocate villages to so called focal sites in order to bring people closer to services. It also encourages community investment in degraded lands (Morris et al. 2004). Land allocation policy was initiated in the late 1980s and has since then been supported in various pieces of legislation (Decree 117/CCM/1989 on the Management, Use of Forest and Forest Land, Decree 169/PM/1993 on the Management of Forest and Forest Land, Decree 186/PM/ 1994 on the Allocation of Land and Forest Land for Tree Plantations and Forest Protection, Forestry Law 1996 and Land Law 1997).

The land allocation process started slowly. The government has more systematically carried out the allocation of forest land to households and communities only after enacting the Forest Law (1996) and Land Law (1997). Currently, the implementation of the programme has more or less stopped due to lack of national funding (Soulivanh et al. 2004).

The Decree on the Sustainable Management of Production Forests (Decree 59/PM/2002) enables villagers' participation in production forest management. One of the objectives of this decree is to "create a framework and a facilitating mechanism for sustainable management of production forest areas based on the participation of villagers in planning, management and benefit sharing". In Laos the framework for local communities' participation in forest management is called "village forestry".

The National Growth and Poverty Eradication Strategy gives top priority to agriculture and forestry sector development in achieving food security and better livelihoods for the people. Village-based natural resource management, sustainable participatory management and processing of NTFPs, tree planting, capacity building and the participation of villagers in conservation activities are among the measures proposed to alleviate poverty and ensure more sustainable management of forests (Government of Lao PDR 2003).

4.1.2 Forest lands and forest tenure

Forest classification

The Land Law (1997) classifies land into eight categories: agricultural land, forest land, construction land, industrial land, communication land, cultural land, land for national defence and peace keeping and water-area land. Forest land is defined as all land, with or without forest cover, which the state has determined to be forest land. Forest resources encompass all resources on forest land such as soil, flora, trees, water, wildlife, etc. Forests and forest land are further classified into five different categories: protection forest, conservation forests, production forests, regeneration forests and degraded forests. Protection forests are mainly established for the protection of watershed areas and the prevention of soil erosion and conservation forest for conserving biodiversity and historical, cultural or scientific values. Production forests are forests and forest lands for providing timber and other forest products for national socioeconomic development and for people's livelihood needs. Regeneration forests are young forests or fallow areas classified for rehabilitation and restoration into natural forests. Degraded forests are forests, which have been heavily damaged, i.e. are without forest cover or are barren land. Degraded forest land can be used for tree planting or it can be allocated to individuals and organisations for tree planting and agricultural production or other purposes in accordance with national economic development plans (Forest Law 1996).

Forest classification is done at two levels. At macro level, forests and forest lands are categorised into national and provincial forest categories. Forests located on village lands are classified using the same classification system during the land use planning and land allocation process (Schindele 2004).

According to a national estimate the total forest area in Laos is 9.8 million hectares. Production forests cover 33% of this area (over 3.2 million hectares). Production forest areas (PFAs) are large, continuous tracts of production forest established according to the Prime Ministerial Decree 59/2002. Eight PFAs have been officially established. Conservation forests cover 49% of the forest area (4.8 million hectares) and protection forests about 10% (one million hectares). From the conservation forests 3.4 million hectares are included in National Biodiversity Conservation Areas (NBCAs) (MAF 2005).

Forest tenure and land allocation

In Laos all land, including natural forests and forest lands, is owned by the national community, represented by the state. The state is responsible for land management and allocation of land to individuals, families and organisations for effective use. The State protects the property rights of organisations and individuals and ensures the rights to use, transfer and inherit land in accordance with the laws (Constitution 2003). Individuals and organisations can have the right to possess and use any tree, natural forest and forest land, if they have received approval from the relevant authority (Forest Law 1996). The Land Law (1997) recognises temporary and long term use rights to land. Land titles represent long term use rights. So far they have been issued mostly in urban areas (Chanthalasy et al. 2005).

The Provincial Agriculture and Forestry Office (PAFO) and District Agriculture and Forestry Extension Office (DAFEO) are responsible for the overall organisation of the LUP/LA process. In practice, the forestry staff has taken a principal role in the implementation of the programme. In the land use planning/land allocation process the boundaries of village land are demarcated and the land is mapped and divided into different land use categories. An agreement on village boundaries is signed with neighbouring villages. Agricultural land is allocated to households; the allocated area depends on the labour force in the family and on the kind of production the land is used for. Forest land is allocated for village management. Degraded forest land or barren land can be allocated to households according to their labour force and capacity to plant and rehabilitate forest (Forest Law 1996). These lands are mostly fallow lands used for shifting cultivation.

LUP/LA has been seen as a means to implement and enforce government policies and regulations, especially to reduce and eliminate shifting cultivation in the upland areas. (Rock 2004, Soulivanh et al. 2004). In shifting cultivation areas, the allocation of upland plots for shifting cultivation has been restricted to three per family. Large areas previously used for shifting cultivation have been classified as forest lands, where cultivation is forbidden. This has reduced the amount of land available for food production. Shortened fallow periods are not enough to reinstall the productivity of the land and have lead to reduced rice yields and increased rice shortage (Morris et al. 2004, Soulivanh et al. 2004, Ducourtieux and Castella 2006). This is the situation in large areas of the country where the land area suitable for permanent cultivation is limited.

In general, the LUP/LA, and especially the clarification of village boundaries, has improved land management and forest protection and regeneration (Kallabinski and Lundgreen 2004, Soulivanh et al. 2004). An analysis of the land use changes in the four Northern provinces between 1993 and 2000 indicates that the amount of land used for shifting cultivation has decreased, while the amount of forest land has increased. The amount of land used for permanent agriculture has also increased slightly (Thongmanivong and Fujita 2006).

LUP/LA process has been conducted in over 6 000 villages (out of 10 500). The allocated land totals over eight million hectares. Approximately six million hectares of this land is forest land. Majority of allocated forest land has been categorised as conservation, protection and regeneration forest (MAF 2005).

4.1.3 Devolution in forest management in Laos

Allocation of use rights (Case LAOal)

The rights to use degraded or bare forest land can be assigned to individuals/households according to their labour and financial capacity to plant and rehabilitate the forest **(SEC_H)**. The allocated area should not exceed three hectares for each labourer in the family. If more land is needed, it can be leased from the state. The land allocation confers land use right, i.e. the right to use the land for a specific purpose and given objectives agreed on in the land management contract (Forest Law 1996, Land Law 1997).

In the land allocation process, farmers are issued Temporary Land Use Certificates (TLUCs). These documents consist of certificates, land use contracts and parcel maps **(SEC_B)** (Soulivanh et al. 2004). TLUCs are valid for three years and can be inherited, but they cannot

be sold, leased or used as collateral. After using the land according to the contract for three years, land users can request for long term use rights, land titles **(SEC_O, EXC)**. Land titles would give long term secure use rights **(DUR)**. Titles can also be sold, inherited and used as collateral **(TRA_{HH})** (Land Law 1997). In practice, TLUCs have not been transferred to long term use rights (Evrard 2004, Soulivanh et al. 2004).

In many cases, the status of the land use right is unclear because TLUCs have not been transferred to long term use rights and the original certificates have expired. In some areas, villagers also seem to be unaware of the procedures for transferring TLUCs to long term use rights and obtaining titles (Soulivanh et al. 2004). Both temporary land use certificates and permanent titles have generally been issued to men (GRID 2004). Villagers also pass TLUC-based land use rights to others, despite the fact that they can legally not be sold (Evrard 2004, Soulivanh et al. 2004). TLUC transfers are not officially recognised. Because of this, new holders cannot use TLUCs written for another name as evidence of their land use right.

The land user will be fined if he fails to use forest land according to the given objectives and the law. For first or minor offences education and training will be applied. For serious offences TLUCs can be withdrawn (Forest Law 1996, Land Law 1997). DAFEO is responsible for monitoring the use of allocated land and its conformity to the land use contract. However, in practice the monitoring has been very limited and undeveloped allocated land has not been withdrawn and reallocated (Soulivanh et al. 2004).

Land use right can also be terminated if the land is needed for public purposes. The holder of a land use right will receive a suitable compensation or new land will be given as compensation. The law does not specify for what public purposes land requisition is possible. A committee consisting of representatives of concerned parties will decide on the compensation (Land Law 1997). Prime Ministerial Decree (192/2005) on Compensation and Resettlement Caused by Development Project states the principles for compensating losses and negative impacts, which result from the government taking away rights to use and manage land or changing the land use objectives. Those who are affected by the project are entitled to compensation, resettlement assistance and livelihood rehabilitation to ensure that their livelihoods will not be worse off than before the project. These rights are also granted to people living in rural or remote areas even if they do not have land use certificates or other documents of their land use right **(SEC_C)**.

Degraded forests are areas with very little or no forest cover. The detailed "use targets" that determine how the land should be used are given in the land use contract **(MAN_M, MAN_E)**. The use targets depend on the slope, production capacity of the land, and on the need for agricultural land. Degraded lands can be used for agroforestry, livestock production, planting of commercial tree species and reforestation. The MAF Instruction (822/1996) specifies the permitted uses for different slope gradients.

The trees and forest which have been planted or rehabilitated using the planter's own labour and funds belong to the planter **(USE_T)**, but the planting needs to be acknowledged by the state. Cutting of self planted trees for family use should be reported to village authorities. DAFEO authorisation is needed to plant, thin and harvest trees for sale (Forest Law 1996). Small scale private plantations have expanded in some areas after the land allocation process. Smallholder plantations are usually small, about two hectares on average (Schindele 2004, Ketphanh et al. 2006). Small teak plantations have been established especially in Northern Laos. During recent years smallholders have increasingly planted rubber (Ketphanh et al.

2006). NTFPs are mainly collected from natural forests. Some important NTFPs are also harvested in small amounts from planted and agroforestry plots and plots used for shifting cultivation. Land holders seem to be free to collect and use these products from their own plots **(USE_{NTFP})**.

Households and individuals have the general obligations to preserve and develop forests and forest resources, use forest and forest lands according to regulations, not to degrade or exhaust forests, prevent forest fires and contribute to preventing forest destruction by any means. In addition, they need to preserve water sources, wildlife and the environment, as well as pay royalties and fees according to laws and regulations (Forest Law 1996). They also need to provide information to authorities regarding the use of forest and forest lands. Also, the Land Law (1997) states that land use should not have a negative impact on the natural or social environment. It delegates individuals and households the obligations to protect the land (e.g. against soil erosion) and to ensure that the land area in each land category is not diminished without correct authorisation.

Village forestry (Case LAOvf)

Village forests

Villages are administrative territories at the lowest level in the state's administrative hierarchy. Village administrative authorities are also the fourth level in the administration of forests and forest lands under ministerial, provincial and district administration (Forest law 1996). Villages are administered by a village headman, who is assisted by deputy heads and committees (Constitution 2003, Law on Local Administration 2003). The village headman is elected by the village's population for a three year term and can be re-elected. He represents the village and is responsible to the district administration and to the villagers for implementing his role and duties (Law on Local Administration 2003).

A village is a legal entity that has rights and duties described in the law **(SEC_H)**. Forest and forest land are allocated to villages for administration and use. Village administration is responsible for the utilisation, preservation and protection of natural resources and the environment within the village. It is responsible for implementing government policies, laws and resolutions, and has the right to enact rules for regulating the use of resources within the village area (Law on Local Administration 2003). Villages can exclude other local users from using the resources in the village area. They also have the rights to participate in the management of production forest areas within village boundaries and to participate in log sale decisions done at the provincial level **(EXC)** (see village participation in production forest areas below).

Village area is not defined in the legislation, and there are no clear criteria for the delineation of a village area (MAF 2005). In practice, village area and village forest are defined in the land use planning/land allocation process. Village forest is defined as an identified area allocated by the government to the village for management, protection and utilisation according to a management plan (MAF Regulation 535/2001). The procedures for identifying a village forest area must proceed according to the MAF Instruction 822 (1996) on forest-land allocation for management and use. The LUP/LA process includes village boundary survey **(SEC_B)**, land use zoning and land use planning, as well as forest surveys and categorisation to protection, conservation, production, rehabilitation and degraded forests. In this process,

village boundaries are negotiated and agreed on with neighbouring villages. Villages can also be allocated forest that is adjacent to the village area, but outside village boundaries (MAF Instruction 822/1996).

Villagers can in principle influence land use planning in the village area and the objectives of forest management through the LUP/LA process. But while the process should be participatory, in practice land use planning has been implemented with varying degrees of participation (Soulivanh et al. 2004). Limited funds and capacities have led to simplified LUP/LA process and limited village participation. Villagers' are mainly involved in the initial steps of data collection, and less in the land use zoning and drafting of village regulations. The overall focus of the LUP/LA process has been more on increasing forest protection than on securing the livelihood of the rural population (Evrard 2004, Rock 2004). There has also been confusion regarding the different forest categories and villagers' use rights in different categories (Soulivanh et al. 2004).

Lao legislation does not recognise communal land use rights (Soulivanh et al. 2004). Villages' rights to manage forest land are based on Village Forest and Agricultural Land Management Agreement. This agreement is a contract between a village and district forest authority **(SEC_O)**. It provides for the area, location, objectives, management and utilisation of different forest categories. It is an official document and conveys villages the rights to protect, use, benefit, and inherit and the rights for compensation in relation to the village forest. According to the Contract Law (1990), contracts may be amended on mutual agreement. If the other party suffers losses because of the amendment, these losses should be adequately compensated by the other party. Management contract can be cancelled if it has been seriously violated. The violator needs to compensate the damages caused to the other party. Disputes between the contracting parties can be settled in courts.

The Decree 192/PM (2005) on Compensation and Resettlement Caused by Development Project is also applicable to village lands. The decree specifically mentions community resources that are negatively affected because of change in land use or loss of land use right. Communities and individuals are entitled to receive compensation, resettlement assistance and livelihood rehabilitation. Customary rights are legally recognised within village boundaries (Forest Law 1996, MAF Order 54/1996). Customary rights can be limited and removed by law, and the law should provide compensation in all cases where the means of livelihood are affected (MAF Order 54/1996) **(SEC_C)**.

The rights and obligations regarding village forests are subject to being a member of the village, i.e. living in the village area. They are implicitly valid also for the children of the villagers and are thus in this sense inheritable **(TRA_C)**.

Management agreements are valid for five years and are renewable **(DUR)** (NAFRI et al. 2005). They are general agreements, which do not contain precise forest management prescriptions. Management plans for village forests are drawn in cooperation with DAFEO **(MAN_M)** (MAF Regulation 535/2001). Village authorities have the right to enact rules concerning the management and use of forest land and resources in the village area. These rules as well as the management plans are approved by DAFEO (Forest Law 1996). Written village regulations, which describe the rules relating to the traditional use and management of forest land, have been produced in connection with the LUP/LA process. In principle, these regulations should be developed in cooperation with the villagers (MAF Instruction 822/1996,

MAF Regulation 535/2001). However, in some cases pre-defined regulations have been brought to village leaders for signing (Rock 2004, Soulivanh et al. 2004).

While clear village boundaries have the potential for reducing conflicts with neighbouring villages (Kallabinski and Lundgreen 2004), the delineation of boundaries has sometimes created conflicts between villages, which have traditionally shared forest resources (Fujita et al. 2005). The enforcement of village regulations on outsiders has in some cases been a serious problem (Soulivanh et al. 2004).

Village level management units (Village Forestry Unit, Village Natural Resources Committee or another committee) are established for the management, protection and conservation of forest resources, to enforce rules and regulations, and to patrol, monitor and control activities in village forests **(MAN_E)**. Members for different committees are nominated in a village meeting. These nominations are approved at the district level (PM Decree 102/1993). The new Decree (59/2002) on the management of production forest areas establishes Village Forest Organisation (VFO) for villagers' participation in the management of production forests under the village's responsibility.

Village forest management institutions can restrict activities, which have negative effects on forest resources. They can also apply sanctions and take legal action against offenders. They also have the duty to organise the implementation of the district's directives regarding forestry activities, and monitor, record and report to the DAFEO changes in the forest condition and in the circumstances for undertaking forestry work in the village (Forest Law 1996). They can also establish groups or associations for conducting forestry activities, for example NTFP harvesting or marketing groups (MAF Regulation 535/2001).

Villagers and organisations within a village are also assigned general obligations to develop forests, protect village forest from degradation and depletion, adopt measures to prevent forest fires and contribute to the prevention of all forms of forest destruction (MAF Regulation 535/2001). Village headman's duties include conflict resolution within the village. He can also propose to higher-level authorities to suspend orders or cancel activities, which are against laws, rules and the village's common interests (Law on Local Administration 2003).

Customary use rights to forests are formally recognised within the village area. In the Forest Law (1996) customary use is defined as the use of forests, forest lands and forest products which has been undertaken for a long period and recognised by society or by law. Customary use must be conducted according to Village Forest and Agricultural Land Management Agreement and village regulations and it may not conflict the law.

Customary rights include harvesting of non-prohibited tree species to make fences and for fuel wood, the collection of forest produce, hunting and fishing of non-prohibited species for household consumption, and other uses following custom **(USE_{NTFP}, USE_T)**. Customary use should not damage forests and forests resources or hamper the rights and benefits of individuals and organisations. Customary use includes harvesting for sale non-restricted NTFPs when it is not conducted as a business for considerable profit. NTFP harvesting for additional family income should be done according to the MAF Regulation 221/2000. This regulation restricts the harvesting of certain NTFPs to specific seasons and prohibits certain destructive harvesting methods or gives conditions under which harvesting is prohibited (MAF Regulation 221/2000). For commercial purposes, NTFPs can be gathered from natural

forests according to a management plan approved by DAFEO and recognised by the District Governor (MAF Regulation 535/2001).

In most villages where LUP/LA has been conducted, the management agreement includes rules and obligations regarding the use and management of forest lands. In comparison with the management based on customary rights, these rules have imposed additional restrictions and obligations to villagers (Manivong and Sophathilath 2007).

A large share of the existing natural forests has been classified as protection or conservation forests. In village conservation and protection forests, forest utilisation is generally very restricted. In production forests, harvesting for villagers' own needs is allowed but commercial utilisation has basically been prohibited. The village authorities authorise wood harvesting for household use. Village production forests supply villagers with NTFPs, fuel wood and building material. Cutting of non-prohibited tree species is allowed for building, repairs and family consumption according to village regulations. The amount of wood harvested is limited to five cubic meters per household. When wood is needed for constructing or renovating schools, hospitals, temples or other public places, it is treated as a special case, and an approval from the head of DAFEO is needed (Forest Law 1996, MAF Regulation 535/2001). Commercial NTFP harvesting can take place in forests classified as production forests.

Village participation in Production Forest Areas

Forest lands with good commercial potential have generally been kept under provincial or district jurisdiction and not allocated as village forests (WB et al. 2001). The new legislation concerning Production Forest Areas creates the framework for villagers' participation and benefit sharing in production forests with commercially valuable forests.

Villagers have the right to participate in the planning, management and benefit sharing in production forest areas when village forests are included in the established Production Forest Areas (PFAs). Commercial harvesting of timber and other forest products can only be conducted in demarcated management areas under approved management plans. Activities not included in the approved annual operational plans are prohibited (PM Decree 59/2002).

After the official establishment of a PFA, management plans (10 year long term, 5 year medium-term and annual operational plans) are drawn. PAFO and DAFEO coordinate with local authorities and villages to conduct field inventories for preparing management plans. Management areas are identified at provincial, district and village levels. At the village level management areas may cover one village or a group of villages. The annual operational plans for managing PFAs at village (group of villages) level are approved by DAFEO (MAF Regulation 0204/2003).

Forest Management Units (FMUs) are responsible for the sustainable management, conservation and use of PFAs under District Forestry Units. VFO's (or Group of Village Forest Organisations GVFOs') participation is based on a Village Forest Management Agreement with FMU. These agreements state the rights and responsibilities of each party in the implementation of the PFA management activities, conflict resolution and revenue generation. The agreement is signed by FMU and VFO(s) and certified by DAFEO. The minimum term for this agreement is the period of the management plan. It may be amended

with mutual consent of both parties (MAF Regulation 0204/2003). FMU makes the management decisions consulting VFO/GVFO and implements management plans with VFO participation. VFOs or GVFOs organise a village team to conduct field operations (Phanthanousy and Sayakoummane 2005).

PAFO issues harvesting permits for each PFA. Permits are based on annual harvesting plans issued by the government and pre-harvest inventories. Logs and forest products from PFAs are sold to processing plants. PAFO coordinates timber sales with representation from FMU and VFOs **(EXC)** (PM Decree 59/2002). In practice, however, timber sales have been conducted at the provincial level without FMU and village representatives' participation (WB and MFA 2005).

Disputes between the parties involved in the actual management of a PFA are first to be solved with the sectoral and administrative authorities in the jurisdiction. Legal proceedings will be applied if disputes cannot be solved though administrative means (PM Decree 59/2002). VFOs should also participate in conflict resolution concerning production forest activities and participate in monitoring and law enforcement, as well as report violations of legislation that may degrade forest resources and environment in a PFA to higher authorities (MAF Regulation 0204/2003).

Currently villagers' participation in production forest management is implemented under the Sustainable Forestry for Rural Development project. The project covers the four most active timber producing provinces in the country and includes about 400 villages (Ojanperä and Siltanen 2005).

According to the MAF Regulation 0240/2003, "additional revenues", i.e. revenues over the floor price covering royalties and harvesting costs, are divided into two portions: 30% goes to the national budget and 70% is shared between different funds. Of the 70% share, 25% is transferred to village level local development funds and used for village development. These funds should be used according to DAFEO approved village development plan.

Calculations based on the information on the logging season 2004-2005 in two provinces clearly indicate that the government is the main beneficiary. The government collects 71% of gross revenues and over 89% of the net revenues (after the logging costs have been deducted). Only about 10% of the net revenues benefited the villagers as paid wages and transfers to the village development funds. Of the gross revenue, about 4% was paid to villagers as wages and another 4% was transferred to village development funds. The current benefit sharing arrangement has been considered insufficient to provide incentives for villagers to participate in sustainable forest management. Further, if the gross revenues decrease because of lower bids for timber, the benefits for villagers will become very small (WB and MFA 2005). Combined with the limited participation in the management planning and decision making concerning PFAs, small or minimal benefits for villages can reduce the villagers' role only to that of paid labour.

4.1.4 Fuzzy membership scores for cases LAOal and LAOvf

Table 12 presents the fuzzy membership scores for the cases LAOal and LAOvf. The scoring is based on the above case descriptions.

Table 12. Fuzzy membership scores for cases LAOal and LAOvf.

Fuzzy set	Scores for case LAOal	Scores for case LAOvf
USE= USE_{NTFP} *USE_T	1	0.33
USE_{NTFP}	1	0.67
USE_T	1	0.33
MAN= MAN_M *MAN_E	0.33	0.33
MAN_M	0.33	0.33
MAN_E	-	1
EXC	1	0.33
TRA= TRA_{HH} +TRA_C	1	1
TRA_{HH}	1	-
TRA_C	-	1
DUR	1	0.33
SEC= SEC_O *SEC_B *SEC_H *SEC_C	1	0.67
SEC_O	1	0.67
SEC_B	1	1
SEC_H	1	1
SEC_C	1	1

4.2 Nepal

4.2.1 The role of devolution in forest policy in Nepal

In Nepal, the failure of the state to protect nationalised forest resources against deforestation and forest degradation led to significant policy changes in the late 1970's. The enactment of Panchayat Forests and the Panchayat Protected Forests Regulations in 1978 enabled the handing over of limited areas of government forests to panchayats. Panchayats were the lowest administrative level of the government and governed a village (or a group of settlements) and its territory. This legislation formally recognised villagers' rights to manage forest and formed the basis for the subsequent development of community forestry in Nepal.

The Master Plan for the Forestry Sector (MPFS) in the late 1980s provided the foundation for the further development of community forestry (HMG 1989). Community and private forestry, and national and leasehold forestry were two of the six forestry development programmes in the MPFS. The plan emphasised the handing over of forest in the Middle Hills to local communities for fulfilling forest-related basic needs. The eight (1992-1997) and ninth (1997-2002) five-year plans for the forestry sector emphasised public participation in forestry development though private, community and leasehold forestry (Amatya 2002).

After the establishment of democracy in 1990, panchayats were replaced with village development committees, and the responsibilities for forest management evolved around the concept of user groups. This concept had been introduced to local administration with the Decentralisation Act of 1982. It was adopted in the forest policy to ensure local participation in forest management after it had become clear that panchayats did not represent the actual forest users and their traditional use rights. The new policy was formalised in the Forest Act

(1993) and the Forest Regulations (1995). The Forest Act (1993) emphasised the handing over of forest to user groups as community forests. The community forestry programme received highest priority in forest policy implementation throughout the 1990s.

In 1998, the National Planning Commission declared leasehold forestry as a priority programme for poverty alleviation. The Leasehold Forest Policy was approved in 2002 to further enhance the role of leasehold forestry in poverty reduction and environmental rehabilitation (HMG 2002). Currently the programme is implemented in 30 of the 75 districts (Kanel 2006). It is planned to eventually cover the whole country. The policy acknowledges that leasehold forestry by itself cannot improve livelihoods and that it should be combined with other programmes such as animal husbandry or cottage industries (HMG 2002). In many areas community forestry and leasehold forestry coexist, even though there has been some tension between the advocates of these approaches. The forest legislation gives priority to community forestry by stating that any part of national forest, which is suitable for community forests, should not be given away as a leasehold forest (Forest Act 1993, Forest Regulations 1995).

The Forest Sector Policy 2000 (HMG 2000) is an update of the Master Plan. It recognises the crucial role of the devolution of the decision making power and benefit sharing in the sustainable development of forest resources. The three main approaches of the current policy are *national forestry* in areas with high value forest resources (mainly the Terai area)[4] and in areas with important biodiversity or protection values (watershed areas), and *community forestry* and *leasehold forestry* in areas with degraded forests. Large forest blocks will be delineated, gazetted and managed as national forests. A collaborative forest management system will be established in the areas under state management to include all stakeholder groups into the forest management and benefit sharing. In these areas, the policy restricts community forestry development to barren and isolated forest lands (HMG 2000). The implementation of this policy is still in a pilot phase; it is currently implemented under two donor funded projects in eleven districts. The collaborating partners include Department of Forests (DoF), local government (district and village level) and users. In this model, the central role is given to the District Forest Coordination Committees and Collaborative Forest Management Groups (DoF 2006). Community forestry is the main approach in the hills.

The main objectives of the forest sector in the Poverty Reduction Strategy Paper/Tenth five-year plan (2002-2007) are to support poverty alleviation by creating employment opportunities for the poor, women and marginalised groups through participatory development programmes, to ensure the supply of forest products, and to maintain environmental balance (National Planning Commission 2002). The plan recognises the success of the community and leasehold forestry programmes in creating income opportunities for the poor. It also considers the user group approach as particularly useful in mainstreaming poor and deprived communities in forestry sector activities, and calls for the expansion of the leasehold programme.

[4] Nepal can be divided into three main geographic regions: the Terai-Siwalik area, the Middle Hills and the High Mountains.

4.2.2 Forest lands and forest tenure

In the Forest Act (1993), forests are defined as areas fully or partly covered with trees. The law classifies forests into national forests and private forests. Practically all forests are under public ownership (FAO 2005). National forests are under the ownership of the state and include: government managed forests, protected forests, community forests, leasehold forests and religious forests. Community forests are national forests handed over to a user group. Leasehold forests are national forest areas, which are leased to any corporate body, industry or community (Forest Act 1993). Government managed forests are national forests that do not belong to any other category. The Forest Policy (HMG 2000) has added two categories to the categorisation of forests: conservation areas and protected watersheds. They include areas gazetted under the National Parks and Wildlife Conservation Act (1973) and areas designated as protected watersheds under the Soil and Watershed Conservation Act (1982).

The community forestry programme started as a programme for providing for the forest-related basic needs of the local population in the Middle Hills that cover 41% of the country's total land area and 45.5% of its population (Springate-Baginski et al. 2003). Most of the established Community Forest User Groups (CFUGs) are in this area. Currently 14 337 CFUGs manage over 1.2 million hectares of forest. About 1.6 million households are involved in community forestry (DoF 2006).

The implementation of the community forestry programme region has been more difficult in the Terai because of the higher ethnic diversity, higher number of forest users, recent settlement and greater mobility of the population combined with higher pressure to convert forest into agricultural land, proximity of markets and high value forest resources. Only about 10% of the community forests are in the Terai area, covering a little over 200 000 hectares (Bampton and Cammaert 2006). Leasehold forests cover currently just over 11 000 hectares. They are managed by 2 499 leasehold groups. Altogether these groups involve over 18 000 households (DoF 2006).

4.2.3 Devolution in forest management in Nepal

Community forestry (Case NEPcf)

The Forest Act (1993) defines community forests as national forests handed over to a user group for development, conservation and utilisation for collective benefit. The authority for handing over community forests has been devolved to District Forest Office (DFO). The DFO is authorised to hand over any part of national forest to a user group in the form of community forest **(SEC_O)**. A user group is defined as a group registered according to the forest law for the management and utilisation of a community forest. The user group is entitled to develop, conserve and manage the forest as well as sell and distribute forest products according to an operational plan. It is also entitled to exclude others from using the forest **(EXC)**. The DFO should provide support to the CFUG in drawing up the constitution and operational plan (Forest Act 1993). The highest authority in a CFUG is held by the assembly that consists of all group members.

The community forest development process includes five main phases: identification of forest users and the formation of community forest user group, drawing CFUG constitution, preparation of an operational plan, implementation of the operational plan, and revision and

updating of the operational plan (Kanel 2006). The initiative to form a CFUG can come either from the forest users or from the DFO. The membership unit in CFUGs is a household. Users willing to manage a forest as a community forest have to submit a written application to DFO (Forest Regulations 1995). In principle, the first phase in the CFUG formation process is the identification of the actual local forest users and the forest area that they have traditionally been using. Every household in the community is entitled to become a member in the user group. The DFO also considers the distance between the forest area and the local users and their capacity and willingness to manage the forest, but village or other administrative boundaries have no effect on handing over community forests (Forest Act 1993, Forest Regulations 1995). The sizes of the established user groups and community forests vary significantly. The average number of households in a user group is around 100 and the average size of a community forest around 50 hectares (Brown et al. 2002).

The application for registering the user group must be submitted to the relevant DFO together with the constitution of the group. The constitution specifies the membership of the group and the establishment of the user group committee. The committee members are elected by the assembly. Membership in a CFUG is registered under the name of the household head (Biggs et al. 2004).

The CFUG constitution defines the rules concerning community forest, benefit sharing and management of internal conflicts as well as sanctions against breaking the rules. After being registered, the CFUG is recognised as a legal, autonomous, corporate body, with perpetual succession **(SEC_H, TRA_C, DUR)**. It may acquire, use, sell or otherwise transfer community forest products but it cannot sell, mortgage or otherwise transfer forest land (Chakraborty et al. 1997).

The user group needs to prepare an operational plan for the requested forest area **(MAN_M)**. Operational plan covers issues such as forest boundaries **(SEC_B)**, forest condition, forest types, objectives of forest management, block division and silvicultural methods to be used in the management, harvesting, protection and improvement of the forest as well as income generating program. It should also include provisions related to the use of the income acquired from the sale of forest products and provisions regarding penalties for acts that are contrary to the plan, as well as any other matters prescribed by the DoF. The operational plan regulates the extraction of forest products and specifies, which products the CFUG is allowed to collect, sell and distribute (Forest Regulations 1995).

The operational plan has to be approved by the DFO. The DFO is required to provide technical and other cooperation in drawing of the operational plan. With the CFUG's consent the DFO can also make changes in the operational plan (Forest Regulations 1995). According to the legislation DFO's role is to verify that the operational plan confirms to the Forest law (1993), Regulations (1995) and Community Forestry Directive (1995). Usually a ranger from DFO helps to prepare the operational plan. Plans are renewable every five or ten years; normally they are made for five years (CFD 2005). After the operational plan has been approved, the forest area under the plan is handed over to CFUG as a community forest. The user group receives a certificate of the recognition of the community forest.

If DFO wants to alter the operational plan, it must be done with CFUG's consent (Forest Regulations 1995). According to the law CFUGs can make amendments to the operational plan and inform DFO. If the amendment is likely to have significant adverse effects on the environment the DFO may instruct the CFUG not to make the amendment. This instruction

binds the user group (Forest Act 1993). In practice the revision of the operational plan requires DFO approval. The CFUG needs to submit annual reports of its activities to the DFO, which monitor and evaluate the performance of CFUGs (Community Forestry Directives 1995).

The Forest Inventory Guidelines (DoF 2000, revised 2004) made forest handover and renewing of operational plans conditional to a detailed forest inventory. The purpose of the inventory requirement is to limit forest product harvesting to the annual increment. However, the renewal of expiring operational plans has been delayed because of the limited capacity of the user groups and even district officers to conduct required inventories. Also, the process of handing over new community forests has been slowed. The complexity of the inventory requirements and the technical skills required in their implantation increases CFUG dependency on DFO (Ojha et al. 2003). In most CFUGs operational plans are not updated according to the regulations and forest management does not follow operational plans (Yadav et al. 2003). Generally, the operational plans do not include provisions for NTFP management, but concentrate on the management of timber, fuel wood and fodder (Ojha 2000).

The DFO can cancel the registration of a CFUG and rescind its rights to the community forest if the group doesn't follow the operational plan, if it undertakes any action with significant adverse environmental effects, or if it fails to comply with the law. The CFUG can appeal to Regional Forest Director, whose decision is final. If a community forest is taken back, it needs to be handed over as a community forest to a reconstituted user group (Forest Act 1993). There are no provisions for compensating the investments made by CFUG in forest protection and development. It has also been argued that as both DFO and Regional Forest Director are employed under the forestry administration their decisions are likely to be biased (Balbase 2000). The DFO is also entitled to take actions against CFUG committee members if they are found to act against the Forest law or regulations (Ojha et al. 2003).

The state can give any forest area for implementing a plan of national priority (if it does not have significant adverse environmental effects). This applies to community and leasehold forests. The government must make appropriate arrangements if communities or people suffer losses when forest area is granted for other use (Forest Act 1993). The operators of the project pay the compensation to the individuals and communities who have suffered because of the project **(SEC_C)** (Forest Regulations 1995).

CFUGs are prohibited to clear forest for agricultural purposes, to build huts or houses, to take any action that may cause soil erosion and to extract soil, rocks, sand, etc. Cash crops, other than food crops, can be cultivated only if it does not affect the crown cover and production of the main forest product. The planting of cash crops needs to be described in the operational plan. DFOs monitor and evaluate community forests. The user group can punish people taking actions against the operational plan and recover compensation for any losses or damages caused by such actions **(MAN_E)** (Forest Act 1993, Forest Regulations 1995).

CFUGs are entitled to use, sell and distribute forest products according to the operational plan. They can fix the prices of forest products independently. CFUGs need to fulfil the needs of their members, surplus forest products can be sold outside user group **(USE_{NTFP}, USE_T)** (Malla 2000). Forest products can be distributed between the group members or sold internally at prices fixed by the group. Most CFUGs have restricted the use of commercially valuable forest products such as timber, fuel wood and traded NTFPs. Community forests

may, however, be utilised for supplying timber and poles for construction and tool making within the user group. Timber is then usually distributed through auctions or tender. Members of the user group are usually allowed to collect leaf litter, fallen twigs and branches and grass free of charge. Except for these products, CFUGs do not generally have rules for collecting NTFPs, which do not have market value (Malla 2000). CFUGs need to keep record of the sales outside the user group, and DFOs need to be informed about the sale rate of forest products. DFOs register the iron stamps prepared by CFUGs to mark timber transported outside CFUG area (Forest Regulations 1995). DFOs controls the harvesting of trees by issuing permits and additional hammer marks even on areas under approved operational plans (Bampton and Cammaert 2006).

Most of the forests handed over to CFUGs have been degraded forest or planted forest established by the government. CFUG activities have concentrated on the protection and improvement of the forests and on allowing for the most part only subsistence use of forest products. CFUG members contribute by planting, thinning, pruning and cleaning, watching the forest, by attending meetings and assemblies, and by paying fees to the CFUG. The income from community forests is used for the development of community forests and various community development activities, such as infrastructure development (Acharya 2002).

In general, community forest management has been protection oriented. Some CFUGs are taking a more active role in forest management. The majority of CFUGs, however, is not utilising their forests to the full potential (Yadav et al. 2003, Kumar 2002). As the condition of the forest areas under CFUGs have improved, new opportunities for revenue generation have emerged. Even though commercial utilisation of community forests is allowed in the law, it has not been so in practice. There is a general lack of consensus among policy makers and within DoF on the role of commercial utilisation of forest in community forests, which has lead to unclear directions and even contradictory orders to DFOs and field staff (Kumar 2002).

Leasehold forestry (Case NEPlf)

Leasehold forest is a national forest leased to any institution established under the current law, or to a forest-based industry or to a community for purposes specified in the law. These purposes include raw material production, tree planting, eco-tourism, agroforestry and operating insect, butterfly and wildlife farms. If a corporate body or an industry and a community apply for the same forest area, the law gives priority to a community, where majority of the people live below the poverty line (Forest Act 1993, Forest Regulations 1995).

Leasehold forestry programme is targeted especially at the poorest members of the communities, landless or near-landless farmers. Degraded national forest areas are leased without fees to relatively small leasehold groups of marginal people within a community for 40 years **(DUR)**. The lease can be extended by another 40 years. The eligibility criteria are not defined in the forest legislation. In practice, participation is restricted to farmers with less than 0.5 hectares of land and an annual income less than Rs 6100 in 2002 (about USD 80). Usually leasehold groups consist of five to ten families (Karmacharya et al. 2003). In practice, many households belong to both CFUGs and leasehold groups (IFAD 2003).

Leasehold forest user groups (LFUGs) do not have a legal status. This severely undermines the security of the use rights granted through the lease. The legislation does not include any provisions for the formation and registering of a leasehold group **(SEC_H)**. The lease certificate alone is not enough to give the leasehold group a legal status under the current laws. The rights for transfer and alienation are also unclear under the leasehold approach. At present the leasehold certificate recognises only group rights, not the rights of individual members. It is not clear whether the rights based on leaseholds can be inherited **(TRA_C)** (IFAD 2003).

Currently the authority to register forest leasehold groups is held by the Small Farmer Development Project. The process of handing over leasehold forests has been cumbersome and time consuming, involving forest authorities at different levels up to the ministerial level. The lease of a leasehold forest is based on an application. The application needs to include an economic feasibility study and description of the area and borders **(SEC_B)**, forest products and other natural resources in the area, as well as a general evaluation of the possible environmental impacts and an outline for an action plan. After the decision of handing over the leasehold forest has been obtained, the applicants need to produce a detailed operational plan (Forest Regulations 1995).

In practice, after the initial site selection, an agreement concerning the formation of a LFUG is supposed to be reached with the community. After this has been achieved the LFUG is formed, and the constitution and operational plan are drawn. The leasehold contract is signed between the DFO and the chairperson of the group **(SEC_O)** (Karmacharya et al. 2003). The final decision on the handover comes from the Ministry of Forest and Soil Conservation (HMG 2002).

The Forest Leasehold Policy (HMG 2002) aims at simplifying and speeding up the process by giving the full authority to register leasehold groups and to hand over leasehold forest to DFOs. They shall also have the authority to approve operational plans, renew licenses and monitor leasehold forestry.

The leasehold group is responsible for protecting the leasehold area and developing it according to the operational plan. This plan contains the rules and sanctions regarding the use of the leasehold area. If the leasehold group fails to work according to the operational plan, or takes any action, which has significant adverse effects on the environment, or does not act according to the law, the lease may be cancelled (Forest Act 1993). If the lease is cancelled, the leaseholder is entitled to a compensation based on the DFO evaluation of the forest products the leaseholder has planted and grown in the leasehold area. The damages caused by the leaseholder's actions are deducted from the compensation (Forest Regulations 1995).

The state can give any forest area for purposes that have national priority. If communities or people suffer losses when forest area under leasehold forestry is granted for other use, they are entitled to compensation **(SEC_C)** (Forest Act 1993).

Selling, mortgaging or otherwise transferring the title to the leasehold forest is not allowed. However, resources planted or grown in leasehold forests or in community forests can be used as collateral for the development of the leasehold forest/community forest. Leasehold group is entitled to sell or transfer the leasehold to any other corporate body, industry or community after it has managed the forest satisfactorily for at least one third of the term of the lease. The transfer is subject to ministerial approval (Forest Regulations 1995).

The establishment and operation of leasehold forest raises more conflicts than that of community forests. Because of the eligibility criteria, many community members who have traditionally used the forest are not eligible for leasehold groups. CFUGs, on the other hand, usually include all community members who have traditionally used the forest. LFUGs have had serious problems in enforcing their rights to the leasehold area against others. Community members that have been excluded from the LFUG have refused to respect the rights granted exclusively **(EXC)** to the leasehold group members. Also, they have not respected the rules concerning forest management and utilisation drawn by the leasehold group. On the other hand, rules that have favoured the poorer households' in community forests have been more generally accepted by all CFUG members (Karmacharya et al. 2003, Nagendra et al. 2005, Thoms et al. 2006). To solve these conflicts, LFUGs have accepted new members regardless of the eligibility criteria. These members are, however, not officially recognised and are not included in the number of member households that form the basis for support activities, like distribution of seedlings, forage seeds or training (Karmacharya et al. 2003). Leasehold groups have also formed federations of leasehold groups (inter-groups), which have been more effective in excluding and punishing non-members. In some cases, leasehold area is divided to small plots, which are managed by individual households. Households have generally been effective in excluding others (Thoms et al. 2006).

The rehabilitation, management and utilisation of the leasehold areas are based on five year operational plans approved by the DFO. According to the law, the leasehold group needs to prepare the operational plan **(MAN_M)**. The amendments in the operational plan need an approval from the Ministry (Forest Regulations 1995). In principle, leasehold group members decide on the management measures to be adopted, while district forests office and livestock services office provide technical inputs and support (Singh and Chapagain 2006). However, the trees existing on the leasehold land at the time of handover belong to the government (**USE_T**). The operational plan has to include provisions for the protection and management of these trees (Forest Regulations 1995). The leasehold policy mentions that some part of the income from these trees will be provided to the leasehold group as compensation for protection. Practical arrangements for implementing this policy are still lacking (HMG 2002).

The Forest Regulations (1995) give the leaseholders the responsibility to protect the forest and use and develop it according to the operational plan. Leasehold groups can develop use rules for the leasehold area and impose fines for rule violations (Thoms et al. 2006). If leaseholders need assistance in protection, the DFO should provide it **(MAN_E)**. DFOs should also monitor the implementation of the leasehold programme in their area, and LFUGs should inform DFOs yearly about the species and quantities of forest products planted.

Rehabilitation of leasehold forests is mainly based on the protection of existing trees and on enhancing natural regeneration by limiting grazing. Also, fire protection and agroforestry plantations have a central role in rehabilitation. Multipurpose forest trees for forage, fuel wood and timber, as well as and fruit trees are planted. Self planted trees can be utilised by the leasehold group. LFUGs are entitled to forest produce like grass, tree fodder, fuel wood and other NTFPs **(USE_{NTFP})**. Also, cultivation of NTFPs including grass is allowed, but the cultivation of cereals and grazing are not allowed in leasehold forests. Livelihood improvement is based on cultivation of grass and other activities to increase the amount of fodder to support small livestock (Gautam et al. 2003, IFAD 2003). In some LFUGs products are harvested collectively and divided equally, in others products are harvested individually (Karmacharya et al. 2003).

4.2.4 Fuzzy membership scores for cases NEPcf and NEPlf

The fuzzy membership scores for the cases NEPcf and NEPlf are presented in Table 13. The scoring is based on the above case descriptions.

Table 13. Fuzzy membership scores for cases NEPcf and NEPlf.

Fuzzy set	Scores for case NEPcf	Scores for case NEPlf
$USE = USE_{NTFP} * USE_{T}$	1	0.67
USE_{NTFP}	1	1
USE_{T}	1	0.67
$MAN = MAN_{M} * MAN_{E}$	1	0.67
MAN_{M}	1	0.67
MAN_{E}	1	1
EXC	1	1
$TRA = TRA_{HH} + TRA_{C}$	1	0
TRA_{HH}	-	-
TRA_{C}	1	0
DUR	1	0.67
$SEC = SEC_{O} * SEC_{B} * SEC_{H} * SEC_{C}$	0.67	0.33
SEC_{O}	0.67	0.67
SEC_{B}	1	1
SEC_{H}	1	0.33
SEC_{C}	1	1

4.3 Vietnam

4.3.1 The role of devolution in forest policy in Vietnam

The new Forest Development Strategy (2006-2020) emphasises the participation of the state and non-state sector, including smallholders, communities and private companies in forest protection, management, harvesting, processing and marketing. It recognises the importance of forest owners' clear rights, obligations and benefits in forest protection and development. The strategy targets to complete the allocation and lease of all forests and forest lands to forest owners (state organisations, private enterprises, cooperatives, communities and individuals) by 2020. Land allocation and diversification of forest activities are carried out to improve forest dependent people's livelihoods. Livelihood improvements are specifically targeted at poor households, women and minority groups in remote areas (Decision 18/2007).

Since the early 1990's forest land allocation to organisations (including State Forest Enterprises), households and individuals has been one of the central strategies in the Vietnamese forest policy. The main objective has been to improve forest management and protection through assigning clear ownership and responsibilities over forests and forest lands to different actors. According to the Forest Development Strategy households and communities will be allocated or leased forests and forest lands, which they have traditionally used. Scattered forests close to villages will be allocated to households, prioritising poor households and ethnic minorities. Testing and scaling-up of community forestry models will continue (Decision 18/2007).

National programmes have been important in the implementation of forest policy. The 327 Programme (Re-greening barren hills -programme, implemented 1993 - 1998) was followed by the current 5 Million Hectare Reforestation Programme (5MHRP). The main objectives of this programme are to protect the existing forests and to re-establish 5 million hectares of forests in order to increase the forest cover to 43% (by 2010), to effectively use bare hills and mountains and create employment in order to alleviate poverty and increase incomes in the mountainous regions, to complete land and forest allocation as well as sedantarisation of farming and population, and to supply wood and other forest products for domestic consumption, for the industry and for export (Decision 661/1998). Its implementation relies on local people's participation in tree planting and forest protection. Local people are also seen as the main beneficiaries of the programme.

A new Production Forest Development Policy was submitted for prime ministerial approval in 2007. This policy supports economic entities in investing in production forest plantations, especially in disadvantaged communes. The policy aims at establishing two million hectares of production forests between 2007 and 2015, and to contribute to income creation and employment opportunities in mountainous communities (Dinh Ngoc Minh 2007). Also the government policy (Decision 187/1999), which aims at restructuring State Forest Enterprises (SFEs) to viable commercial entities, supports local people's increasing participation in forest management. The policy includes reallocation of much of the land and forest currently managed by SFEs to households and individuals (Artemiev 2003).

A new Law on Forest Protection and Development (LFPD, 2004 in effect since April 2005) encourages organisations, individuals and households to receive uncultivated and bare land for forest development, and prioritises afforestation and plantation development for raw material production. This law enables the allocation of land to village communities. Communities had not been eligible for land allocation before. Land allocation to communities or groups of households is relevant especially in the highland areas where ethnic minorities still manage land according to their traditional rules and customs.

The Comprehensive Poverty Reduction and Growth Strategy (Socialist Republic of Vietnam 2003) emphasises measures for providing incentives to plant forests and for promoting communities' role in forest protection and natural regeneration. It calls for speeding up the forest land allocation process, and together with implementing fixed cultivation and settlement, to ensure that people living in mountainous areas, especially poor households, can directly manage and protect their forests. Households should be provided with appropriate incentive systems that link their responsibilities to forest benefits.

4.3.2 Forest lands and forest tenure

Forest classification

The Land Law (2003 in effect since July 2004) categorises all land in the country according to the purpose of use into agricultural land, non-agricultural land and unused land. Agricultural land is further categorised into sub-categories, which include *production forest*, *protection forest* and *special use forest* lands. Unused lands include bare lands and degraded hills.

The LFPD (2004) defines forests as ecological systems consisting of forest fauna, flora, micro-organisms and forest land. In forests, the minimum canopy cover is 0.1 (the degree of forestland covered by forest canopy per acreage). Canopy consists of timber trees, different kinds of bamboo and typical flora. Forests include planted forests and natural forests on production, protection and special use forest land.

The total area of land officially classified as forest land is about 19 million hectares. A large amount of this land is without forest cover (6.7 million hectares). It includes bare lands on hilly and mountainous areas, which have potential for forestry development. In 2005, the total forested area was 12.6 million hectares, and forest cover 37%. The forested area consisted of about 10.3 million hectares of natural forest and about 2.3 million hectares of plantation forest. Special use forest land covers 1.9 million hectares, protection forest land 6.2 million hectares and production forest land 4.5 million hectares (Decision 18/2007).

Special use forests are mainly used for nature conservation, scientific research and for the protection of cultural and historical relics and landscapes. They include national parks, nature conservation zones, landscape protection areas, and scientific research and experiment forests. *Protection forests* are mainly for protecting water sources and land, preventing erosion and desertification, and regulating climate. *Production forests* are used for production of timber and NTFPs in combination with environmental protection. Production forests include natural and planted production forests and seedling forests (LFPD 2004).

The forest cover decreased from 43% in 1943 to 27.2% in 1990. Since 1990 rehabilitated natural forest and plantation areas have increased and led to an increase in the total forest cover. However, deforestation is still continuing in some areas, e.g. in the Central Highlands and Southeast regions (de Jong et al. 2006).

Forest tenure and land allocation

In Vietnam, land is property of the entire people and managed by the state (Constitution 1992). The Land Law (2003) relates to all categories of land and regulates land use planning, land tenure and access to land. The state can assign land use rights for stable and long term use with administrative decisions to land users, which include organisations, households, individuals and communities. Organisations, households and individuals can also be leased land (Land Law 2003). Land use right certificate (Red Book) is the proof of state recognition of the land use right. They are issued by the Ministry of Natural Resources and Environment for every land plot.

Forest allocation and lease, as well as the change of forest use purpose, should be based on land use plans and approved forest protection and development plans drawn at national, provincial, district and ward/commune levels. According to the Land Law (2003), land use planning at the commune level should be a participatory process, and the outcome must be publicly announced. However, in most cases land allocation has been done without land use planning and the degree of local people's participation varies greatly. In many villages, people's participation has been limited (Tran Ngoc Than et al. 2004).

In Vietnam, agricultural land allocation precedes forest land allocation and has mostly been completed in lowland areas. In some cases, agricultural and forest land allocation have been done together. Forest land allocation should have been completed by the end of 2005 (Rock

2004). Forest allocation to households, individuals and communities needs to be based on an allocation/leasing plan drawn at commune level and approved by the District Peoples Committee. The allocation and lease are based on the forest classification (LFPD 2004).

Special use forests are allocated to management boards, which are organised by the state or to research and development institutions or training institutions. If local people cannot be relocated from the strictly protected zones of special use forests, they should be allocated forest for protection through short term contracts. In ecological restoration zones, special use forest can also be contract to local households and individuals for protection and development (LFPD 2004).

Protection forests can be allocated to management boards, economic organisations, armed forces, households and individuals. The law specifies that headwater protection forest covering 5000 hectares or more and smaller areas, which have an important protection function, must be managed by management boards. Other production forests can be allocated or leased to local households and individuals for protection and use (LFPD 2004). Protection forest management boards can contract protection forest land to local households and individuals for protection and development (Land Law 2003).

Natural production forests and planted production forests can be allocated to local households and individuals. Large natural production forests shall be assigned to or leased to economic organisations. Scattered natural forests can be allocated to households and individuals for protection, development, production and business (LFPD 2004).

Communities can be allocated forests which they are managing efficiently[5] and forests which serve their common interests and cannot be assigned to organisations, households or individuals (LFPD 2004). According to other legal documents village communities can be allocated protection and production forest (Decree 23/2006, Draft Circular 4A2/2006) and also special use forests (Decision 186/2006).

In the LFPD (2004) forest owners are defined as organisations, households and individuals, which have been assigned or leased forests or land for reforestation and have a state recognised forest use right or ownership right (to planted production forests). Forest owners also include those organisations, households and individuals that have received forests through transfer from other forest owners. The ownership rights over planted production forest means the right to possess, use and dispose of trees, animals and property associated with planted forests, when the owner has invested in the planting during land assignment or lease term. Forest use rights and the ownership rights over planted production forests can be registered.

Vietnam was a centrally planned economy until the late 1980's. Under this system SFEs were the main forestry production units. Due to their historical importance SFEs still control a large part of the forest resources and forest land. Most of the forest land has been allocated to SFEs. Currently 368 SFEs manage about 4.4 million hectares of forest land, including 3 million hectares of natural forest (de Jong et al. 2006).

[5] The criteria for efficient management is not given in the law.

In 2003, households and individuals had been allocated and leased 3.76 million hectares of forest land, which is about 19% of the total forest land (19 million hectares). This land consisted of 2.7 million hectares of forested land and one million hectares of unused land (barren land and denuded hills). Forested land included 1.7 million hectares of natural forest and almost one million hectares of planted forests (MONRE 2003, referred to in de Jong et al. 2006).

Of the total forest land used by households and individuals (forestry farms), 72.2% is allocated, 25.8% is contracted and 2% is leased (Vo Dai Hai 2003). As the amount of leased land seems to be very small, the case studies concentrate on the allocated and contracted forest land.

The progress in forest land allocation varies greatly between provinces. Land allocation has mostly concentrated on the central and northern parts of the country (Vu Hoai Minh and Warfvinge 2002). In Central Highlands, the region with the largest amount of forest land, most of the forest land has not been allocated (Swinkels and Turk 2006). In practice, the allocation of land use certificates has been restricted to barren land designated to reforestation and regeneration. Existing forests have generally not been allocated, and they have remained in direct state control (Apel and Van Viet 1998, Neef and Schwarzeimeier 2001). Natural forests have been mostly assigned to households with protection contracts (Chirst and Kloss 1998). Recently there has been a shift towards allocating also natural forest to households and communities (Nguyen Hong Quan 2003).

Already before the revision of the Land Law in 2003 and the LFPD in 2004, forest land had been allocated to communities or groups of households in many provinces. Land allocation to communities has been implemented on a pilot project basis, and these initiatives have often been supported by donors (e.g. Rural Development Project in Dak Lak and Social Forestry Development Project in Song Da, both financed by GTZ; Sweden Mountain Rural Development Programme in Yen Bai and Ha Giang provinces; and UNDP funded project in Thua Thien Hue Province). A new Pilot Community Forest Management Project was accepted in 2006. It will test community forestry in 40 communes in ten provinces (Decision 106/2006). SFEs and special use forest and protection forest management boards have also contracted forest and forest land to communities for protection.

It has been estimated that in 2001 communities managed 2.3 million hectares of forest land (with and without forest cover), accounting for about 15% of the national forest land. Of this area 1.2 million hectares was forest and forest land allocated to communities and over 900 000 hectares were contracted to communities. The remaining over 200 000 hectares were under different traditional management models (Ha Cong Tuang 2001).

4.3.3 Devolution in forest management in Vietnam

Allocated forest land (Case VIEal)

Forest land allocation is based on the Land Law (2003), Law on Forest Resources Protection and Development (2004), Decree on the Implementation of the Law on Forest Protection and Development (Decree 23/2006) and Government Decree (163/1999) concerning the allocation of forest land to organisations, households and individuals for stable and long term forestry purposes. The state can assign land use rights for stable and long term use to land users. Land users include organisations, households, individuals and communities **(SEC_H)**. In addition to the national level legislation, provincial level regulations regulate the implementation of the forest land allocation process. Forest land allocation decisions are based on the land use planning, local forest land use demand, current land use status and households'/individuals' production capability (Inter-Ministerial Circular 62/2000).

A draft circular gives instructions on the procedures related to forest allocation and rental (Draft Circular 4A2/2006). Households and individuals must apply for the assignment of land use rights. District Peoples Committees decide on the allocation and give permits for land use change. In the allocation process, the borders of each plot are identified, plots are measured **(SEC_B),** and forest category, status and volume are defined. The allocation process has generally been a top-down process. Only recently, and especially in donor funded projects, have land use planning and land allocation been implemented with a more participatory approach.

Households and individuals can be allocated protection forests, natural production forest and planted production forest without forest use levies. They need to live in the commune where the forest is. Protection forests are allocated for long term stable management, protection and use. Production forests and production forest land are allocated for 50 years (Land Law 2003). If the trees in production forests have a rotation period longer than 50 years, the allocation period can be extended to 70 years **(DUR)**. If the land user has used the land according to laws and plans, the allocation term can be extended (Decree 23/2006).

After being allocated land, land users are entitled to a land use certificate (Red Book), which is a proof of state recognition of the rights **(SEC_O)**. The state protects land use rights against others **(EXC)** (Land Law 2003). Households and individuals may also register forest use rights and ownership rights over planted production forest (LFPD 2004). In practice, there are often long delays before Red Books are issued, and one fifth of farmers have neither temporary nor permanent land use certificates (MARD 2001a, MARD and UNDP 2003). For example, in Son La province only 30-40% of the allocated forest land was provided with Red Books (Pham Xuan Phuong 2003).

According to the Land Law (2003), land use certificate should bear the names of both husband and wife if the land belongs to both of them. However, this policy is yet to be put into practice. In the land allocation process the land use certificate has generally been issued to the head of the household, i.e. a male representative (Stanford et al. 2006).

Forest land can be recovered, if the forest owner fails to conduct forest protection and development activities within 12 months of being allocated protection forests, special use forests or production forests for protection and development. Similarly, land can be recovered if owners fail to conduct forest development activities within 24 months of being allocated

land for forest development. Land can also be recovered if it is not used for the stated purposes, or if it is used inefficiently, or if it is not used according to the law. In these cases no compensation is granted (Land Law 2003, LFPD 2004).

The state can also recover assigned land for purposes of defence or security, and for public or national interests or economic development. When allocated forest land or a part of it is recovered, the results of household's labour and investments are compensated **(SEC_C)** (Land Law 2003, LFPD 2004). As compensation new land for the same use purpose or land for planting new forest can be assigned. If new land is not available, compensation in kind or cash will be provided, as well as support in the form of training for a change in production or business and by arranging new jobs (LFPD 2004).

According to the law, each household or individual can be allocated a maximum of 30 hectares of protection forest and production forest. If they have also been allocated land for planting annual crops, the area of assigned protection or production forests must not exceed 25 hectares. In addition, households and individuals can be allocated a maximum of 30 hectares bare land for forestry production (Decree 23/2006). In practice, the allocated areas seem to be much smaller than the upper limits prescribed in the law. In Dak Lak province, households have on average been allocated 5-10 hectares of forest and forestland (Nguyen Van Xuan 2003). At national level, the average allocated area of forest land is three hectares per household. Forest classification also varies and simplified methods for forest classification are used in the field, sometimes leading to unclear distinction between production and protection forests. This undercuts benefit sharing policies, which are based on forest classification (Pham Xuan Phuong 2003). In practice, households have mainly been allocated production forest land (de Jong et al. 2006). Generally, only degraded and bare lands have been allocated to individuals and households under long term tenure certificates.

The transfer rights depend on the forest classification and the state of the forest at the time of allocation **(TRA_{HH})**. Forest use rights and ownership rights over planted production forest can be transferred, donated, leased, sub-leased, used as collateral and bequeathed. These rights apply to those who have been allocated planted production forests or land for afforestation. Allocated natural production forest, can only be used as collateral with the added value to forest use right brought about by households' investments as compared to the forest use right value at the time of allocation. Allocated protection forest areas can be swapped with another household or individual in the same commune (LFPD 2004). Allocated protection and production forests are bequeathed according to the inheritance law (Decree 23/2006).

The law assigns forest owners general responsibilities to protect their forests and e.g. to draw and implement plans and measures to protect forest ecosystems, and prevent and fight forest fires (LFPD 2004). The land user has to use the allocated land for a specified purpose and follow the general management prescriptions defined in laws, regulations and decisions (e.g. LFPD 2004, Decree 23/2006, Decision 186/2006). The terms and conditions of land allocation give detailed prescriptions about e.g. what species to plant and the spacing to use **(MAN_M)** (Nguyen Van San and Gilmour 1999). The change of the forests use purpose from one forest category to another is possible only when it is done according to approved protection and development plans and permitted by Prime Minister or the president of Provincial Peoples Committee (LFPD 2004).

In general, the land users are entitled to enjoy the results of their labour investments in land (Land Law 2003). The general guidelines for forest management and use are given in the law (LFPD 2004), implementation regulations (Decree 23/2006) and in the regulation of forest management (Decision 186/2006). The rights to manage, use and benefit from forest land depend on the land classification. Households and individuals are entitled to timber and NTFPs from allocated protection and production forests within specific regulations. They are also entitled to carry out eco-tourism (in protection forest) and tourism (in production forest) activities. In general, the exploitation of timber and NTFPs from protection and production forests may not reduce the protection capacity of the forest, and the exploitation volume may not be bigger than the growth volume of the forest (Decision 186/2006).

Prime Minister's Decision 178 (2001) is the main document concerning the benefits from allocated forest land. It establishes the principles for benefit sharing between the state and the land user. It has in some provinces been implemented in a slightly modified form (Nguyen Quang Tan 2005). However, even though forest land allocation has been implemented for years, very few have been able to benefit according to this decision. The main reason for this is that most of the allocated forests do not yet meet the standards required (minimum diameter for timber trees and age for bamboos and rattan) for forest harvesting to be allowed (Bao Huy 2006).

Exploitation and benefit sharing in allocated protection forests **(USE_{NTFP}, USE_T, MAN_M)**

When allocated forest is *natural protection forest*, households and individuals can harvest NTFPs, dry, fallen trees and diseased trees and bamboo with the maximum intensity of 30% when forest cover reaches 80% of the allocated land area. They are entitled to the full after-tax value of these products. When forest is allowed to be harvested, they are entitled to exploit timber according to an approved harvesting plan and exploitation permit. They can harvest with the maximum intensity of 20% by using selective cutting, and are entitled to 85-90% of the after-tax value of the products (Decision 178/2001).

When allocated forest is *protection forest without forest cover*, perennial agricultural trees can be planted as major trees or inter-planted with forest trees according to the afforestation plan approved by the provincial/municipal Agriculture and Rural Development Services. 20% of the land can be used for agricultural production and aquaculture. Households and individuals have full rights to the products from supporting trees, inter-planted trees and forest thinning products. Timber can be harvested according to an approved harvesting plan (maximum intensity 20%) and exploitation permits granted by provincial/municipal Agriculture and Rural Development Services. Households and individuals are entitled to 90-95% of the after-tax value of the timber. When households and individuals invest their own capital in planting, they are entitled to 100% of the after-tax value of the timber, but annually only 10% of the afforested area can be exploited (Decision 178/2001). Forest owners must regenerate or replant forest after exploitation during the subsequent afforestation season (LFPD 2004).

Exploitation and benefit sharing in allocated production forests **(USE_{NTFP}, USE_T, MAN_M)**

When allocated *natural production forest*, households and individuals are allowed to inter-plant agricultural and pharmaceutical plants, graze cattle, and use forest products for family needs. A permit for harvesting timber for house-building must be received from the district

level. For harvesting timber an approval and an exploitation permit from provincial/municipal Agriculture and Rural Development Services are needed. The benefits to households and individuals depend on the state of the forest at the time of allocation. The benefits range from 2% (average or rich forest) to 100% (secondary depleted forest). From bamboo forests they are entitled to 95% of the forest products' value. When allocated production forest is planted forest, households and individuals are entitled to 75-85% of the after-tax value of the products (Decision 178/2001).

When allocated *production forest without forest cover*, forest owners must make plans for forest management, protection, production and business. The plans are drawn under the guidance of Commune Peoples Committee or rangers and they need to be approved at the district level. Management can combine forestry, agriculture and fishery production; 20% of the allocated land can be used for agriculture or aquaculture. For forest exploitation, households and individuals must file applications and report to the District Peoples Committee (LFPD 2004). If households and individuals invest their own capital in afforestation, they may decide the purposes and modes of afforestation and what trees to plant. They may also decide on the exploitation and use of the forest products. When forests are planted with state funding, forest owners are entitled to the benefits according to the project (Decision 178/2001).

In general, the procedures for acquiring permits to harvest on allocated land are complicated. The permission depends on the purpose/use of the forest, source of funding and forest status at the time of allocation. The harvesting from plantations for owners own use is simple, but on the other extreme, harvesting from allocated natural forest with forest cover is very complicated (Vietnam-Finland Forestry Sector... 2000). Some provinces only allow forest owners to harvest planted trees, not natural trees on their land. For the sale of NTFPs district level approval is needed (Vu Huu Tuynh 2001). For households it is difficult to obtain logging permits and permits to use the land for cultivation. Unclear policy and guidance regarding the procedures for obtaining permits contribute to households collecting timber illegally and cultivating land without permits (Nguyen Quang Tan 2005). In addition, the procedures for calculating benefits for households are considered too complicated and partly unclear (Nguyen Quang Tan 2006).

Contracted forest land (Case VIEcon)

SFEs and protection forest and special use forest management boards can further contract forest land to communities, households and individuals **(SEC_H)**. Special use and protection forests are contracted according to the Decree 01/1995, and production forests according to the Decree 135/2005 **(SEC_O)**. The contract term is 50 years for special use and protection forests. In production forests the contract term should correspond to the production cycle of the forest but it may not exceed 50 years **(DUR)**. These decrees are silent about renewing contacts. The contract conveys the rights to protect, manage and use the contracted area according to the regulations and contract terms **(EXC)**. The contract needs to clarify the land area, forest area, and quality of forests, and the position and boundaries of the area **(SEC_B)**.

Long term contracts account for 31% of the land under SFEs control. Over 53% of SFE's land has been contracted under short term contracts (de Jong et al. 2006). The short term contracts are based on the 5MHRP and before that on the 327 programme. Under the 327 Programme land was contracted on annual bases. Also, under 5MHRP the contracts are often made for

one year. These contracts can be renewed if the terms of the contract have been carefully followed. The total contract terms must not exceed five or six years, depending on the forest category (Nguyen Quang Tan 2006). The average area contracted from SFEs and management boards is four hectares per household (FSSP 2003).

Under the 5MHRP, the Ministry of Finance allocates state funds to provinces for the implementation of provincial level projects and to management boards for the implementation of central government level projects. Depending on the character of each local project, the Provincial Peoples Committee will determine the exact amount of the payments and contract terms as well as what silvicultural measures are needed (MARD 2001b). The 5MHRP has mainly funded reforestation in protection and special use forests. In seven years, between 1998 and 2005, 2.3 million hectares of forest have been contracted for protection (Nguyen Quang Tan 2006). Reforestation in production forests is not supported by government funds (de Jong et al. 2006).

If a household violates the contract, it must compensate for the damages this has caused. If the violation is serious, the contract can also be annulled. If the state organisation breaks the contract, the contracted household is entitled to be compensated for the losses the violation has caused (Decree 01/1995, Decree 135/2005). Households can also be compensated for their investment in contracted special use and protection forest land when they move to another place, take up another occupation, or can not longer work the land. Investments are also compensated when state organisation takes back part or all of the contracted special use or protection forest. This is possible when the area is to be used for another purpose, which has been approved by the authorised State agency **(SEC_C)** (Decree 01/1995).

If the recipient of the contract dies, a representative from the same household can take over the contract for the rest of the contract term **(TRA_{HH})** (Decree 01/1995). Contractual disputes regarding contracted production forests are settled according to civil law (Decree 135/2005).

The options for management, use and benefit from contracted forest depend on the classification of the forest, the state of the forest, and who invests on the planting or reforestation in the case of degraded forests and bare lands **(USE_{NTFP}, USE_T, MAN_M)**. The contracts regarding special use and protection forests must specify the benefit sharing, rights and obligations of both sides, and their commitments to ensure the implementation of the contract (Decree 01/1995). The annual payments for protection and reforestation are based on the funding from the 5MHRP.

For *contracted special use forest* the benefits are very limited. Only people living in special use forests can be contracted to protect the forests. They can be offered to participate in tourism or service activities related to the forest. The annual payments for forest protection must not exceed 50 000 dong/hectare/year (about 3 USD in 2007). In areas under natural regeneration with additional planting of forest trees, the payment may not exceed 1 million dong/hectare distributed over six years. In areas requiring reforestation, the state covers all the costs of planting (MARD 2001b).

Similarly, the payments for *protecting natural protection forest* may not exceed 50 000 dong/ha/year for a maximum of five years. In protection forest areas under natural regeneration with additional planting of forest trees, the payment may not exceed 1 million dong/hectare distributed over six years. Contracted households are also entitled to collect fuel wood and NTFPs and thinning products. They can also exploit bamboo (30%) when forests

cover 80% of the contracted area. Households are entitled to 80-90% of the after-tax value of forest products. They can also benefit from timber according to an approved plan. Households' share of the benefits depends on the state of the forest at the time of contracting and varies from 95% (depleted secondary forest) to 2% (rich forest). If households invest their own funds in regeneration, they are entitled to 100% of the after-tax value of the timber (Decree 178/2001).

The payments for protection of special use and protection forests have varied between provinces. In poor provinces the payments have been considerably smaller than indicated in the programme (e.g. 25 000-30 000 dong/hectare/year). On the other hand, Ho Chi Minh province has provided additional funding for protection contracts and the payments have been clearly higher than provided by government funding (FSSP 2003).

For *reforestation of protection forests* the state pays on average 2.5 million dong/hectare (4 million dong/hectare since 2003) for planting and tending during three years (de Jong et al. 2006). Households may plant perennial agricultural trees or interplant them with forest trees according to an approved plan. They are entitled to all products from supporting and inter-planted trees and thinning products, NTFPs, and to use 20% of the forest area without forest cover for agricultural production. They can benefit from timber harvesting according to an approved plan. If households have received state support they are entitled to 80-90% of the after-tax value of the harvest. If households have themselves covered all the costs of reforestation, they are entitled to 100% of the products' value after taxes. In special use and protection forests NTFP collection should be done under the guidance of the contracting party (Decree 178/2001).

Decree 135/2005 regulates the contracting of *production forests*. It differentiates between contracting natural and planted production forests and land for planting production forests. The contract needs to specify the land and forest area, quality of the forest, boundaries and benefit sharing arrangements, as well as the contract term. Regardless of the state of the forest at the time of contracting, households are entitled to intercrop industrial trees with forest trees, combine agricultural production with forestry and fishery under forest canopy or on the edges of the forest if it does not adversely affect the growth of forest trees and is done under the guidance of the state organisation. All products from intercropped trees belong to the households. Households are also entitled to forest products from silvicultural measures that follow technical procedures and processes and the guidance of the state organisation. State organisations guide, inspect and supervise contracted households regarding production plans, technical process and quality of products. The benefits from major forest products are shared between the contract parties according to their capital and labour investments.

When households are contracted *natural production forest*, they have to follow the accepted management plan (drawn by state organisation) in organising the management and protection of the forest. During the contract term, households are entitled to forest products, and to apply silvicultural measures, as well as to agroforestry production and to graze animals under the forest canopy according to the guidance from state organisation (Decree 135/2005).

Planted production forests are contracted for further investment, tending, protection and combined agroforestry production. Households are entitled to exploit forest products after applying silvicultural measures, and to combine agricultural production with forestry and fishery under guidance of the state organisation and to benefit from these products according to the contract (Decree 135/2005).

On lands for *planting production forests*, the state organisation should draw a forest planting project. Households are contracted for planting, tending and protecting forests. The harvested timber is shared between the contract parties according to their capital and labour investments. When households invest in forest planting and the state mainly supplies seedlings and provides technical guidance, households are entitled to the timber harvested. They need to pay for the labour and services received from the state organisation with part of the harvest. Households are then entitled to the remaining products but must sell them to the state organisation at prices agreed upon at the time of harvesting. When the state has either fully or partly invested in the planting and households provide mainly labour, households are compensated according to the contract at the time of harvesting (Decree 135/2005).

Communities have also been contracted to protect forests. The main benefits for contracted communities have been the payments for forest protection. Communities have also been entitled to fuel wood and NTFPs. In Ha Giang province, large areas of protection forest have been contracted to communities for 20 years. The community is paid 50 000 dong per hectare a year for five years and it is entitled to harvest forest products (fuel wood, bamboo, etc.) as agreed. Each community sets up its own regulations for forest management and utilisation of the money received. (O'Reilly 2000). In general, the annual payments are not large enough to provide an incentive for long term protection of the contracted forests and there is no legal framework for benefit sharing between community members (Ha Cong Tuan 2001).

Community forestry (Case VIEcf)

The new Land Law (2003) and LFPD (2004) enable the allocation of land for "population communities" and their participation in forest management and utilisation. Communities are not part of the administrative hierarchy in Vietnam. Communes can consist of many villages, communities and hamlets, and are the lowest administrative unit.

"Population communities" consist of all households and individuals living in the same village, hamlet or equivalent unit and having the same customs and practices (Land Law 2003, LFPD 2004). In order to be eligible for land allocation their production, life, culture and beliefs should be closely associated with forests, and they should be capable of managing forests. The law gives priority to the allocation of forests to ethnic minority communities (Decree 23/2006).

Communities are included in the defined land users, and land users are entitled to be protected by the state against infringements of their legal land use rights, which include rights for exclusion, usufruct and protection by the state **(EXC)**. Communities are not included in the definition of forest owners in the LFPD (2004), but they are mentioned as forest owners in a Prime Ministerial Decision on forest management (Decision 186/2006). Communities have the right to have their forest use right recognised by the state for stable and long term corresponding to the forest assignments term (LFPD 2004). Land use certificate is issued to the community and handed to the representative of the community **(SEC_O)** (Land Law 2003). The revised Civil Law acknowledges the concept of "common ownership by the community" for areas defined by traditional customs or as property jointly managed and utilised by members of the community according to an agreement (Nguyen Ba Ngai et al. 2005).

Even though communities are eligible for forest land allocation and are defined in the legislation, communities are not recognised as legal entities in Vietnam **(SEC_H)**. The lack of legal status prevents communities from e.g. making agreements with third parties and opening a bank account. Because of this communities cannot manage funds received from forest products. These funds have now been managed at commune level (Seidel et al. 2007).

Village communities can be allocated forests that they are already using and forests that directly serve the community interests, e.g. as water catchment areas. They can also be allocated other adjoining forest areas, which cannot be allocated to households, individuals or organisations (LFPD 2004). Communities need to apply for forest allocation. The application must be certified by the Communal Peoples Committee under whose authority the forest is located (Decree 23/2006).

Forests are allocated to communities for sustainable long term use (Decision 106/2006/D-BNN). According to the Land Law (2003) protection forests are allocated for long term stable management, protection and use, and land for perennial trees and production forests for 50 years **(DUR)**. The borders of the forest area, different forest categories and their borders, as well as timber volumes and the quality of forest, should be determined within the forest land allocation process. The boundaries of the allocated forest are marked in maps and in the field **(SEC_B)** (Draft Circular 4A2/2006).

The forest assigned to communities may not be divided among community members. Neither can it be transferred, leased, used as collateral or converted to other uses (LFPD 2004). However, rights are subject to membership in the community and are thus implicitly inheritable **(TRA_C)**.

The framework for developing community forestry in Vietnam is very new and still being developed. Slightly different procedures have been used in earlier pilot projects. Several provinces have also issued decisions to guide the implementation of forest allocation and benefit sharing. The procedures differ somewhat from each other, and in some cases also from the national level legislation (e.g. see Pham Xuan Phuong 2003 for Son La province). Guidelines for developing community forestry have been developed in different donor funded development projects. They have included participatory forest assessment and planning as well as the establishment of local regulations for forest protection and development (e.g. Bao Huy 2000, Roth 2004).

Communities may carry out forest management, protection and development activities, monitor changes in forest resources, and report to state agencies on the changes in forest resources and activities related to forests. They need to draw forest protection and development rules for the allocated areas and organise their implementation (**MAN_M**, **MAN_E**). Rules are submitted to the Commune and District Peoples Committees for approval (LFPD 2004, Decree 23/2006). The rules should state community members' rights and obligations in relation to forest protection and development and organising community forestry activities. They should also include rules for treating violations, rules for setting up and managing forest protection and development funds, and regulations regarding benefit sharing within the community (Decision 106/2006). They Village head has the authority to fine for minor offences. Serious offences need to be handled by higher authorities.

The Regulations on Forest Management give detailed prescriptions for the management of forests in different forest categories (Decision 186/2006). It is thus probable that communities will not have very much freeway in drawing forest management plans and forest protection and development rules. Communities will participate in the decision making regarding the harvesting, management and development of forest resources.

Currently community forestry is being tested in a pilot community forestry programme in 40 communes (Decision 106/2006). According to the Guidelines for the Community Forest Management, communities are involved in the forest allocation process, in making forest management plans, and in arranging the implementation of the management plans. Communities have obligations and rights, and they monitor the use and state of the allocated forests. Five year forest management plans are prepared by the community, approved by the Commune Peoples Committee and reported to the District Peoples Committee. District Peoples Committees support and monitor the implementation of management plans. Annual forest management plans are drawn on the basis of the five year plans. They are accepted by the Communal Peoples Committees. Community Forest Management Board is established by a community to draw forest management plans, to organise and coordinate community forest activities for implementing the plans, to monitor the implementation of management plans, harvesting of forest products, and benefit sharing, and to report to commune level (Decision 106/2006).

Communities are allowed to use part (20-25%) of the allocated forest area without forest cover for agricultural production combined with aquaculture. They are allowed to conduct tourism activities, and to receive funding and materials according to special projects, like the 5 Million Hectare Reforestation Programme. Timber and NTFPs from community forests can be used for community members' own needs, for community development purposes and for commercial purposes **(USE_{NTFP}, USE_T)**. Communities decide on the sale of forest products and on prices (Decision 106/2006). Communities have been entitled to use community forests for commercial purposes in a pilot project in Dak Lak (Wahby 2006).

Communities are entitled to be compensated for their labour and investments if the state recovers the land **(SEC_C)** (LFPD 2004). The state can recover allocated land for purposes of defence and security, and for public or national interests, and economic development. As compensation the land user is given new land for the same use purpose. If new land is not available, a monetary compensation will be paid for the land use right value. However, the Land Law (2003) lists cases when compensation is not paid; these include protection and special use forest land needed for certain purposes and agricultural land used by population communities.

4.3.4 Fuzzy membership scores for cases VIEal, VIEcon and VIEcf

Table 14 presents the fuzzy membership scores for the cases VIEal, VIEcon and VIEcf. The scoring is based on the above case descriptions.

Table 14. Fuzzy membership scores for cases VIEal, VIEcon and VIEcf.

Fuzzy set	Scores for case VIEal	Scores for case VIEcon	Scores for case VIEcf
$USE = USE_{NTFP} * USE_{T}$	0.67	0.67	0.67
USE_{NTFP}	0.67	0.67	1
USE_{T}	0.67	0.67	0.67
$MAN = MAN_{M} * MAN_{E}$	0.33	0	0.33
MAN_{M}	0.33	0	0.33
MAN_{E}	-	-	1
EXC	1	1	1
$TRA = TRA_{HH} + TRA_{C}$	0.67	0.33	1
TRA_{HH}	0.67	0.33	-
TRA_{C}	-	-	1
DUR	0.67	0.67	0.67
$SEC = SEC_{O} * SEC_{B} * SEC_{H} * SEC_{C}$	1	0.67	0.67
SEC_{O}	1	0.67	1
SEC_{B}	1	1	1
SEC_{H}	1	1	0.67
SEC_{C}	1	1	1

4.4 Kenya

4.4.1 The role of devolution in forest policy in Kenya

In Kenya, the policy shift towards formally involving local people and communities in forest management is very recent. The new Forest Policy (Government of Kenya 2007) recognises the important role of forests in the livelihoods of forest adjacent communities. It encourages forest communities' sustainable use of forest resources and protects the traditional interests of local communities. One of the seven policy statements emphasises the role of local communities in more efficient forest management. The government empowers local communities to manage forests through community forest associations. They are envisaged to have an important role in rehabilitating degraded and over-exploited arid and semi-arid areas, as well as in developing management plans and managing community forests in dryland areas. Participatory forest management approaches will be promoted in the management of indigenous forests to ensure local community and other stakeholder participation. Participatory forest management is also encouraged in local authority forests (Government of Kenya 2007).

The current Forests Act was enacted in 2005 and has been operational since February 2007. The Forests Act (2005) establishes the Kenyan Forest Service (KFS) to manage all indigenous state forest, draw or assist in drawing up management plans for indigenous state forest and plantations, provide extension to forest owners, farmers and associations in sustainable forest management and collaborate with communities in the management and conservation of forests. It also promotes the empowerment of associations and communities in the control and management of forests, and introduces new forms of cooperation in forest management.

The Economic Recovery Strategy for Wealth and Employment Creation (ERS) is Kenya's poverty reduction strategy paper (Government of Kenya 2003). The strategy focuses on reviving agriculture, tourism, trade and industry. Special programmes will be implemented to develop arid and semi-arid lands. Regarding the forestry sector, the ERS emphasises 1) the development of clear policy to eliminate corruption regarding harvesting of forest products and allocation of forest land for private development and 2) the development of agroforestry and community participation in forest management. The Investment Programme for ERS (Republic of Kenya 2004) presents the priority actions designed to meet the medium-term objectives of the ERS. In the forestry sector, the activities include implementation of the Forest Policy, enforcement of the Forests Act, and promotion of private sector participation in afforestation and management of forest plantations.

4.4.2 Forest lands and forest tenure

The Constitution of Kenya (Revised 2001) is under revision. According to the current constitution, the president holds land in trust for the government. The constitution addresses explicitly only private property and trust lands. Trust lands are vested in local authorities, county councils, for the benefit of the people living on that land. The constitution gives the county councils power to allocate trust land to non-residents and extinguish customary rights in that land.

Since independence Kenya has not had clearly defined land policy or coherent legal framework regarding land issues. The process for formulating a new national land policy is currently underway. The draft national land policy recognises the need for secure land tenure and it designates all land as public, communal or private land. It also recognises and protects customary rights to land. The policy emphasises the need for securing private and community tenure over land and resources, and establishing mechanisms for local participation in resource management and benefit sharing. The Trust Land Act (1970) will be replaced by the Communal Lands Act. This act will vest community lands in local/district authorities and establish clear procedures and criteria for allocation of community land. Special attention is also put in securing the land rights of pastoralists (Ministry of Lands 2006). Until the new land policy and implementing legislation are in place, land tenure issues are dealt within different laws.

Government Land Act (1948) concerns government lands, including forest reserves, unalienated government land and national parks. This act gives the president the power, subject to any other written law, to alienate unalienated government land by granting estates, rights or interests over this land to any person.

The Trust Lands Act (1970) defines the rights regarding trust lands and controls the occupation of these lands. County councils hold the land and should manage it according to the interests of the local people. Management is based on customary law. In practice, customary law has been overridden by the statutory law. The Trust Lands Act (1970) sets procedures for alienating trust land for purposes that are likely to benefit local people. However, trust lands have been alienated disregarding the interests of the local people. The government can also require that a parcel of land is set apart for the purposes of the government. In addition to forest reserves on trust land, some areas of trust land are set aside

as national reserves after the Wildlife Conservation and Management Act (1977), and they are also managed by local authorities (IUCN 1999).

The Group Representatives Act (1968) establishes group ranches defined as demarcated areas of rangeland to which a group of pastoralists have official land rights. A group in this act is a tribe, clan, family or other group of persons that holds land under recognised customary law. Each group needs to have a constitution and elect representatives. Most group ranches are in the areas occupied by pastoral communities. There has been substantial pressure to subdivide group ranches in some districts (Waikanjo and Ngugi 2001). In 2004, there were 401 group ranches with 54 452 members, covering an area of about 7 million hectares (Wayumba 2004).

In the Forests Act (2005), forests refer to any land where vegetation is dominated by any size of trees; they include woodlands. Forest area means any land declared under the Forests Act to be forest land. The act distinguishes state forests, local authority forests and private forests. All forest other than private and local authority forests are vested in the state and subject to use rights granted under the Forests Act or other written laws. Local authority forests are any forests on trust land, which the local authority has set aside as forest according to the Trust Land Act or Forests Act. State forests are any forests declared by the Minister to be state forests according to the Forests Act or previous legislation (Forests Act 2005).

About 1.65 million hectares of indigenous and plantation forest have been gazetted as forest reserves. Other wooded lands cover over 34.9 million hectares. Forest reserves on government land are managed directly by the KFS, but those on trust land (328 136 hectares) are managed by local authorities. About 78% of Kenya's land is trust land. Trust lands include an estimated 100 000 hectares of closed canopy forests and extensive areas of other wooded land (IUCN 1999).

An unknown area of indigenous forest is in private ownership. Although the holdings tend to be small, they are important for catchment and conservation purposes and provide subsistence and small-scale commercial products. Farmers have also planted trees on private agricultural lands (Dewees 1995).

4.4.3 Devolution in forest management in Kenya

Until recently Kenya's forest policy and legislation have not encouraged local communities to participate in forest management. On the contrary, the policy has quite effectively alienated local people from forest management. However, the new Forests Act (2005) introduced new forms of partnerships:

Partnerships in the management of indigenous state forests: The KFS may enter into a joint management agreement for the management of indigenous state forests with any person, institution, government agency or community forest association. The agreement shall cover revenue sharing and management issues. The management of state owned plantations can also be arranged through management agreements.

Partnerships in the management of local authority forests: The management of these forests can be based on management agreement between the local authority and e.g. a NGO, a company, a forest community or an individual.

Community participation: The act includes a specific chapter on community participation in forest management. Participation is based on the formation of registered forest associations.

The Ministry of Environment and Natural Resources has drawn Forest (Participation in Sustainable Forest Management) Rules for the implementation of the Forests Act (MENR 2007). The Ministry has also drawn guidelines for participatory forest management, which will be used to implement community participation and develop enforceable rules and regulations for each forest (MENR 2004). In the guidelines, participatory forest management is defined as "management that involves the active participation of forest adjacent community representatives and registered community associations, as well as other relevant stakeholders in the use, management and conservation of a forest area or part thereof".

Participatory forest management processes can be initiated by government officers, NGOs, community-based organisations or private investors. The first steps in the process are to identify the main interested parties and verify the nature of the resource base in the area. A local planning team consisting of representatives from local forest user groups, authorities and other key stakeholders should be formed. The main task of this team is to work together with other committed stakeholders to assess the forest and community in more depth and to draw a draft forest management plan. This process includes negotiations and agreement on the main roles and responsibilities of each stakeholder. The planning team is a temporary body: the forest management functions will be taken over by a forest association after the management plan has been drawn (MENR 2004).

Already in anticipation of the enactment of the new law many projects have included local people in forest management planning. This has generally been done through establishing community associations to participate in forest management and in the process of drawing participatory forest management plans (see e.g. Mogaka et al. 2001, Vrije Universiteit 2001, Arabuko-Sokoko Forest Management Team 2002, Karanja et al. 2002, UNDP 2004, WRM 2004). Over 60 associations have been or are in the process of being formed (KFS 2007).

Community participation in forest management (Case KENcp)

According to the Forests Act (2005), "a member of a forest community may, together with other members or persons resident in the same area, register a community forest association". A forest community is defined as a group of people who have a traditional association with forest for livelihood, cultural or religious purposes, or is registered as an association or other organisation engaged in forest conservation. In addition, the Participatory Forest Management Guidelines refers to "forest adjacent community" also as a group of persons who live within five kilometres from the edge of the forest (MENR 2004). Community forest associations are registered under the Societies Act (1998), and the membership is not inheritable **(TRA_C)**.

Community forest associations should have at least 50 member households. Associations should draw a constitution to specify the membership in the association, committee structure, and rules for financial management. A forest association committee should be elected to take responsibility of the management of the forest. Forest level management committees may also be elected to manage the forest according to the management plan. In national forest reserves these committees usually include the district forest officer, foresters and other stakeholders (MENR 2004).

A registered association can apply for a permission from the KFS to participate in the conservation and management of a state forest or local forests **(SEC_H)**. The application should include a list of the members of the association, the constitution and financial regulations of the association, a proposal concerning the use and protection of the biodiversity of the forest, and methods for protecting wildlife and plant populations. If a management plan for the area does not already exist, the application needs to include a draft management plan (Forests Act 2005).

According to the Forest Rules, the KFS can authorise community participation under a community forest management agreement or under cultivation permit (MENR 2007). A cultivation permit is issued to members of a forest association for undertaking non-resident cultivation in areas intended for industrial plantations. Under the community forest management agreements associations should conserve and use forests for livelihood, cultural, or religious purposes. Before entering into a management agreement the parties should identify the area and its resources, and consider how the community can utilise the forest and the impacts this use will have. The forest authorities and forest association shall together prepare a forest management plan (community forest management plan) for the forest area, and negotiate and sign a community forest management agreement **(MAN_M, MAN_E)**. During the forest management plan formulation process the main roles and responsibilities of each stakeholder should be negotiated **(EXC)**.

The duration of the management agreement should be stated in the agreement (MENR 2007). According to the guidelines, the management agreement is valid for three years **(DUR)**. It can be extended for another three years, or the agreement can be amended and renewed for some other specific period. Revisions in the agreement are presented in writing to the other party and forwarded to the Forest Conservation Committee[6] for consideration. The final decision regarding revision is made by the KFS (MENR 2004).

The management agreement is made by members of the community forest association committee together with e.g. district forest officers or other stakeholders. It needs to be registered by the KFS. The agreement is signed by representatives of the association and the district forest officer. The forest management agreement is a legally binding agreement that enables different stakeholders to become involved in the conservation and management of a forest area **(SEC_O)**. It includes a survey map of the forest area (or a sketch map showing visible and recognisable demarcation of the boundaries) **(SEC_B)**. The agreement states the management functions of the parties, the rules, regulations and penalties for rule-breakers, the time period of the agreement, how any funds or monies will be managed, how the agreement will be revised or renewed, and how disputes will be settled. It is based on negotiations between the different stakeholders (MENR 2004).

The association should protect, conserve and manage the forest according to the management agreement and the management plan. It can formulate and implement programmes, which are consistent with traditional use rights of the community and the sustainable use of resources. It protects sacred groves and trees and assists the KFS in enforcing laws and regulations, especially regarding illegal harvesting. The association also needs to help in fire fighting and inform the KFS about any developments and changes which are critical for biodiversity conservation (Forests Act 2005).

[6] Forest Conservation Committee is established by the KFS for the effective management of forests in a certain ecological area.

The law sets the terms under which the KFS can terminate a management agreement, or withdraw a particular use right. This is possible if the association breaks the terms and conditions of the agreement, or if the KFS considers that it is necessary for the protection or conservation of biodiversity. The KFS can also terminate the agreement if the association requests it to be terminated (Forests Act 2005). The law does not say anything about compensating the forest association for the investment it has made in developing or protecting the forest if the agreement is terminated or a use right is withdrawn **(SEC_C)**.

The Forests Act (2005) sets the principles and procedures for excisions and for altering the boundaries of state forests and local forests. They are subject to environmental impact assessment. In the case of state forests, parliament approval is needed, and in the case of local forests ministerial decision is needed. The conditions for excisions and altering of borders emphasise environmental and conservation issues; no mention is made regarding the possible rights of local people **(SEC_C)**. However, local residents are entitled to apply for compensation when trust land is set apart and if they according to the customary law have a right to occupy any part of that land or if they are otherwise in some way affected by the setting apart (Trust Lands Act 1970). The bases for compensation are unclear when the borders or the status of the forest is changed but the area remains trust land.

Based on the management agreement, community forest association can be allocated the rights to collect medicinal herbs and grass, harvest honey, timber or fuel wood, to graze and to collect forest produce for community-based industries. An association can also have rights to develop ecotourism and plantations (through non-resident cultivation), wood and non-wood forest products based industries, as well as rights to other benefits agreed upon with the KFS **(USE_{NTFP}, USE_T)**. The activities should not threaten biodiversity conservation. Traditional use rights can be limited in the management agreement (Forests Act 2005). In general, timber licenses can only be issued to plantations on state land and they are meant for the private sector (MENR 2007). Disputes regarding the management agreement are settled by an independent officer appointed by the Forest Conservation Committee (MENR 2004).

Participatory forest management has been implemented with donor and NGO support in several areas. The general trend has been to improve local people's knowledge of natural resources and biodiversity/conservation issues, and to reduce their dependency on forest resources. Alternative forest-related income generating activities have been created because the options for creating benefits based on the utilisation of wood are currently limited in Kenya. Community organisations have been developed and strengthened to facilitate participation in the drawing of forest management plans and in forest management activities. Participatory methods are employed in involving communities in the management planning process (see e.g. Arabuko-Sokoko Forest Management Team 2002). Generally, the role of community associations in forest management seems to be very protection oriented.

4.4.4 Fuzzy membership scores for the case KENcp

Table 15 presents the fuzzy membership scores for the case KENcp. The scoring is based on the above case description.

Table 15. Fuzzy membership scores for the case KENcp.

Fuzzy set	Scores for case KENcp
USE= USE_{NTFP} *USE_T	0.67
USE_{NTFP}	0.67
USE_T	0.67
MAN= MAN_M *MAN_E	0.33
MAN_M	0.33
MAN_E	0.33
EXC	0.33
TRA= TRA_{HH} +TRA_C	0
TRA_{HH}	-
TRA_C	0
DUR	0
SEC= SEC_O *SEC_B *SEC_H *SEC_C	0
SEC_O	0.67
SEC_B	1
SEC_H	1
SEC_C	0

4.5 Mozambique

4.5.1 The role of devolution in forest policy in Mozambique

The Forest and Wildlife Policy and Strategy was accepted in 1997. Increasing the participation of rural communities in the integrated management, fire protection, and use and conservation of forest and wildlife resources is one of the strategic objectives of this policy (Ribeiro 2001). The policy calls for involving people whose livelihoods depend on forest and wildlife resources in the planning and sustainable use of the resources (Salomão 2004).

The Forestry and Wildlife Law (FWL) was enacted in 1999 and Regulations in 2002. They form the regulative framework for the use and management of forest resources. The principles governing the law include "promoting the conservation, management and utilisation of forest and wildlife resources without contradicting the local customary practices and according to the principles of conservation and sustainable utilisation of forest and wildlife resources in the framework of decentralisation". The law also emphasises private sector involvement and its contribution to the development of local communities.

The National Land Policy was adopted in 1995, and the Land Law and Land Law Regulations to implement it in 1997 and 1998, respectively. The Land Law provides strong potential for a change towards more decentralised natural resources management and enhancing partnerships between local communities and investors. According to the Land Law local communities shall participate in the management of natural resources, conflict resolution, land titling processes, and in the identification and definition of land occupied by communities. Natural resources management and conflict resolution can be based on customary norms and practices.

Mozambique's strategy document for the reduction of poverty and promotion of economic growth (Action Plan for the Reduction of Absolute Poverty 2001-2005) lists agriculture and rural development as the main fundamental areas of action (Republic of Mozambique 2001). The principal programme for agricultural and rural development is PROAGRI (National Programme for Agricultural Development). Its objective is to create the conditions needed for sustainable and equitable growth in agriculture, forestry and livestock sectors, and for contributing to poverty reduction and greater food security, while protecting the physical and social environment. PROAGRI's main objectives regarding the forestry and wildlife sectors are to continue interventions to facilitate and expand the activities of communities, the private sector, and other producers in the forestry and wildlife sectors, while paying due attention to the long term sustainable use of natural resources. PROAGRI identifies community-based forest management as one of the key components of the forestry and wildlife sub-sector. The four key components are: 1) strengthening of the state institutions for forestry and wildlife, 2) rehabilitation of state protected areas, 3) developing community-based management of forests and wildlife, and 4) developing the production forest estate (Mansur and Cuco 2002). A significant part of forest sector support is now coordinated through PROAGRI.

The Community Management Unit was created under the National Directorate of Forests and Wildlife as a technical support unit to promote, facilitate and coordinate community-based forest and wildlife management. Provincial level Community-Based Natural Resources Management units have been established in several provinces to plan and execute community forestry programmes (Norfolk 2004).

4.5.2 Forest lands and forest tenure

The Forest and Wildlife Law (1999) defines forests as a "vegetation cover capable of supplying timber or plant products, cover for wildlife, and exert a direct or indirect influence on the soil, climate or hydrologic regime". It further classifies forests into protection, production and multiple-use forests. Multiple-use forests are areas outside protected areas with low forestry potential. Forests with potential for producing wood for industrial purposes cover approximately 19 million hectares. About 35 million hectares is multiple-use forests. Conservation areas cover about 12% of the national territory, about 10 million hectares (Bila 2005).

According to the Mozambican Constitution (1990) all the land and resources therein are owned by the state. The state can grant rights of use and benefit for individuals or judicial entities. All the Mozambican people can have the rights of use and benefit from land. However, the land can not be sold, mortgaged, or otherwise encumbered or alienated. The constitution recognises rights acquired through inheritance or occupation. The state recognises and guarantees the right to property ownership, and states that expropriation may only take place on grounds of public need, use or interest, as defined by law, and will be justly compensated.

The principles of land tenure have been further established in the Land Law (1997), Land Law Regulations (1998) and in the Technical Annex to the Land Law Regulations (Ministerial Diploma 29-A/2000). The principal land use right is the right to use and benefit from land (Direito de Uso e Aproveitamento de Terra, DUAT). This right can be acquired through customary occupation, good faith occupation or by applying from the state.

The Land Law (1997) recognises the existence of customary rights and introduces mechanisms to register them. It acknowledges private, corporate and communal rights of land use and benefit. Communal rights are joint titles. Mozambican nationals who have occupied the land for at least ten years (good faith occupation) and local communities (and individuals) that have occupied land according to customary norms and practices (customary occupation) are entitled to acquire the right to use and benefit from land. The law protects DUAT even without the formalisation or registration of the rights. In principle, the rights based on good faith or customary occupation have the same status as the rights acquired through application from the state. The awarded rights need to be registered.

Communities can apply for a land title issued to the name of the community. This requires a precise and costly mapping exercise, demarcation, and includes the placing of cement markers at reference points around the perimeter. For a formal communal title the opinion of district authorities and the decision of the provincial governor are needed. The Technical Annex to the Land Law Regulations (Ministerial Diploma 29-A/2000) establishes a delimitation process for formalising customary rights. This is a cheaper and faster way to formalise community tenure. It includes e.g. awareness raising in the community, participatory appraisal regarding the social, economic and environmental conditions within the area occupied by the community, a sketch map, and an agreement on the territorial limits of the community with the neighbouring communities. Delimitation is recorded in the National Land Cadastre and a DUAT certificate is issued to the community. In contrast, after demarcation the community land is registered in the Property Records Registry (Chilundo et al. 2005). With the community's approval individuals can apply for personal titles within the community area.

District level approval is necessary for registering the delimitation of community land. This procedure, which is not mentioned in the Land Law (1997), has been added in the Technical Annex (Ministerial Diploma 29-A/2000). It can be used to effectively block the registration of community rights (Norfolk 2004).

The total number of communities that have delimitated community lands is 188. Certificates have been issued to 88 communities. Of the ten provinces in the country, land titles have been issued in only one province (24 titles in Nampula). The size of community lands varies greatly, from several thousand hectares to over 70 000 hectares (Chilundo et al. 2005). Local communities' powers and responsibilities include participation in the management of natural resources, conflict resolution and the titling processes, as well as in identifying and defining the boundaries of the area that the community occupies (Land Law 1997).

The principal ways local people can be involved in or influence decisions on natural resources management are through community land delimitations/titling and community consultations. The Land Law (1997) sets the requirement for community consultation before any request for land rights is granted to outside investors. The application to the state for the right of land use and benefit needs to include an exploitation plan. The maximum term for the right is 50 years, but the right can be renewed. A statement from district authorities is needed to confirm that the area for which the rights are applied for is free and has no occupants. Community consultations should precede the issuing of this statement. The outcome of the consultation should be a written document, signed by community representatives. If the land is occupied, the district authorities' statement should contain the terms for a partnership between the applicant and those occupying the land. However, this procedure is used when a third party applies for rights to use and benefit from the land, not when short term timber extraction licenses (simple licenses) or long term forest concessions are awarded. Community

consultation regarding forest resources utilisation is based on the FWL (1999). The FWL provides communities options to benefit from forest concessions and have a say in the management of forest resources in the area.

The FWL (1999) introduces different ways in which local communities can participate and/or benefit from forest resources. It states that the state can delegate the powers to manage forest and wildlife resources to local communities, associations or the private sector. In relation to this, the regulations state that the terms and conditions for delegation of management powers will be defined in a ministerial diploma[7]. The intention is to involve the communities in the exploitation, use and conservation of forest and wildlife resources. The regulations specify that management authority can be delegated in protected areas, buffer zones, official hunting areas, productive forests, multiple use forests and multiple use zones. The procedures for delegation of these powers have not been specified (Norfolk 2004).

The legal framework is still incomplete, which severely hampers the implementation of the principles introduced by the law. In order to be implemented the FWL needs to be supported by regulations and guidelines, which establish the implementation procedures. The framework for delegating forest management powers to the local level and the guidelines for community consultations and community representation are still lacking (Bila 2005). It has been noted that there has been a lack of political will to implement the forest policy, which has slowed the process of drawing guidelines for implementing the legislation (Johnstone et al. 2004).

Generally, the forest sector is not under effective governance systems. At provincial and district levels the capacities and resources to implement the forest policy are very low or even non-existent (Norfolk et al. 2001, Johnstone et al. 2004). Local participation in forest management and benefit sharing has been limited to projects promoted by international donors and/or local NGOs.

4.5.3 Devolution in forest management in Mozambique

Community participation (Case MOZcp)

Local community is defined as a group of families and individuals who seek to safeguard common interests through protecting forests, pastures, water sources, areas for habitation and agriculture, and areas of cultural importance (Land Law 1997, FWL 1999). A community can define its land area, but this area must be within an administrative boundary legislated by the parliament (locality). The acknowledgement of the community's right of land use and benefit requires that the community has occupied the land according to customary norms and practices, which do not contradict the constitution (Land Law 1997). Communities can appoint representatives. These can be traditional chiefs or newly appointed committees. Even though the law provides a flexible framework for community land delimitations, in practice traditional boundaries and the area under the influence of traditional chiefs or other authorities have been most commonly used as a reference in defining the community area (Norfolk 2004).

The Land Law prescribes procedures for communities to formalise land rights to the land that they have occupied according to customary norms and practices. Communal lands can be

[7] Ministerial Diploma is a technical annex to the law.

delimited and communities can apply for formal title **(SEC_O, SEC_B, DUR)**. This joint title is held by all the members of a particular community, present and future. Rights are thus subject to community membership and implicitly inheritable **(TRA_C)**. The title confers the rights to occupy and use, and limited rights for exclusion and transfer. Through delimitation and registration the community obtains a legal status that enables it to hold rights and to sign contracts **(SEC_H)** (Norfolk 2004). The Technical Annex to the Land Law Regulations (Ministerial Decision 29-A/2000) describes the process for delimiting areas occupied by local communities, the demarcation of these areas, and issuing titles.

The implementation of the Land Law has been slow and only partial. The costs of delimiting communal lands and applying for formal title are very high for communities. In practice, this has prohibited communities from formally securing rights to community lands. The delimitation of community lands has been undertaken only where external donor funding has been available (Alden Wily and Mbaya 2001, Norfolk 2004).

The FWL (1999) restricts the rights to use and benefit of land acquired through the Land Law. The FWL only grants communities rights to subsistence use of forest resources **(USE_{NTFP}, USE_T)**. Subsistence use by members of local communities should follow customary norms and practices (Regulation 12/2002).

Other than subsistence use of forest resources is based on simple licences and forest concession contracts defined in the FWL (1999). Simple licences permit the harvesting of a limited quantity of forest produce within one year. These licenses allow the removal of 500 cubic meters of wood from productive and multiple use forest areas for commercial, industrial and fuel wood purposes, following an accepted management plan. A simple license is granted by provincial authorities and meant for national operators and communities. The holder of this license should show proof of possessing the technical capacity to harvest and transport the requested forest products (FWL 1999, Regulation 12/2002). Almost no licences have been issued to local communities (Mackenzie 2005).

Concession contracts can be acquired to productive and multiple use forest areas for 50 years. They are valid for clearly defined areas, which can cover up to one million hectares with no explicit annual harvest limit. They are meant to supply industrial processing plants or fuel. Concessions are renewable for another 50 years. The holder of a concession contract must guarantee the processing of the products harvested (FWL 1999, Regulation 12/2002). The forest policy gives priority to concessions over simple licenses. In theory communities could also apply for forest concessions but the requirement for guaranteeing the processing of the harvested forest products makes it difficult for communities to attain concession contracts (Ashley and Wolmer 2003). Communities are thus in a weaker position than commercial operators in acquiring concessions even when the forest in question is located on land recognised as community land according to the land law.

The law (FWL 1999) tries to protect local communities' rights to areas under simple licenses or concession contracts by stating that local communities' access and subsistence use of forest products should always be safeguarded in the areas under commercial exploitation.

The right for land use and benefit can be cancelled for public interest. This should follow the principles of expropriation and should proceed by the payment of a fair compensation **(SEC_C)** (Land Law Regulations 1989).

Community consultation and benefits

According to the FWL (1999), communities need to be consulted before forest concessions are allocated to third parties **(EXC)**. Communities need to be consulted also when simple licenses are awarded (Regulations 12/2002). However, communities cannot veto against concessions; they can only negotiate on the terms under which a concession or license is granted. The consultation is done through local government administration. The consultation aims at securing benefits to communities in the form of employment opportunities and infrastructure development. Community consultation is only required at the beginning of the concession (for 50 years) application process, and there are no mechanisms for monitoring whether the benefits negotiated ever realise. Consultations are not required when renewing concessions. According to the Regulations (12/2002), communities should participate in the delimitation of the concession area and they should be given preference when hiring workers.

Approved license and concession applications should include a report from community consultation, i.e. the favourable opinion of the local communities. The contract should describe the benefits for communities and how they will participate. However, there are no established procedures for community consultations, and in practice the processes are weak. Because the law does not consider the company's failure to fulfil the agreement as a violation, the benefits that a community can acquire through consultations are not secure. Systems for monitoring and evaluation of the agreements and the actualisation of benefits to the communities do not exist (Johnstone et al. 2004). In practice, community consultations have so far not encompassed wider community participation. In many cases all villagers are not even aware that a concession has been awarded to lands they have traditionally used (Reyes 2003).

Community representation is also problematic; the legislation does not specify who should represent the community or how the representatives should be selected/elected. In practice, the consultations have generally been conducted with the traditional leaders (Ashley and Wolmer 2003). In some areas, however, local land management committees have been established to manage community land after land delimitation. Also, the relationship between traditional leaders and the democratically elected community management committees (Comité de Gestão Comunitária, CGC) proposed to represent communities in Local Resource Management Councils is unclear (Johnstone et al. 2004). The confusion over representation has been increased by the issuance of a decree (Decree 15/2000), which re-instituted traditional chiefs (or village secretaries or other leaders according to the decision of the community) as the legal representatives of community groups (Norfolk 2004).

The licensing framework for forest resource utilisation includes fees to be paid for simple licenses and concessions. Local communities living in the area under exploitation are entitled to a 20% share of the collected revenue (Regulations 12/2002). This provides a source of potentially substantial benefits for local communities. The revenue allocated to communities should be used for collective benefit and the conservation of natural resources in the area. Until 2005, there were no official mechanisms to implement this policy. A new policy names registered community management committees as community representatives. They should open bank accounts and manage community funds (Ministerial Diploma 93/2005). The system for establishing committees has not been specified. The payment of funds to the committees is subject to opening a bank account; however in rural areas banks are rare (Norfolk 2004).

The FWL recognises "community agents" as community level law enforcement agents **(MAN_E)**. Community agents and local communities, among others, are entitled to half of the fines resulting from their participation in reporting an offence. However, there is no established mechanism for implementing this policy. Only a very small amount of fees is actually paid to communities or community members as a reward for participating in law enforcement (Johnstone et al. 2004).

Participation in management councils

The Land Law (1997) states that in rural areas local communities participate in the management of natural resources and conflict resolution, in addition to identification and definition of the community land. The FWL (1999) creates mechanisms for local communities to participate in co-management of forest resources, while maintaining a strong state ownership over the resources **(MAN_M, MAN_E)**. In general, the legislation gives communities a limited role in management planning, issuing concessions and licences, and in monitoring forest activities.

Community participation is established through Local Resource Management Councils (Comité de Gestão Participative COGEP). They will be created for participatory management of forest and wildlife resources with the aim of protecting, conserving and promoting the sustainable use of forest and wildlife resources. Participatory management should ensure local community participation in the exploitation of forest and wildlife resources and entitle them to benefit from resource utilisation (FWL 1999).

Councils will be made up of representatives from the local communities, private sector, associations and state authorities. The councils are collective persons and have legal personality. In the defined territorial or administrative areas, councils have the power to ensure that sustainable use of resources contributes to rural development, and especially to the development of local communities. Councils participate in the procedure for awarding licences and concessions to exploit forest resources, conflict resolution, and in facilitating and assisting law enforcement regarding resource use. They can propose measures to improve policy and legislation regarding the use of forest and wildlife, enhance fire control, and pronounce upon proposed management plans within their area (Regulations 12/2002).

The legislation does not specify how the councils are established, or how community representatives are selected. It has been suggested that COGEPs will be established at the district level, and that the presidents of the CGCs will represent communities (Nhantumbo and Macqueen 2003, Johnstone et al. 2004). CGCs are community level committees, which represent the community in negotiations, and in planning and management of resources. They can receive and account for the community earmarked tax revenue (see above). CGCs have so far not been specified in the legislation (Johnstone et al. 2004).

In practice, Local Resources Management Councils do not yet exist or function as intended in the legislation (Nhantumbo and Macqueen 2003). They represent several communities, commercial operators, NGOs and government administration, with different economic and political powers and authority. The decision making power is not devolved to the community level; instead it is shared between different actors at the district level, where the influence of

commercial interests can be strong. It is unlikely that this institution can currently represent community interests and concerns (Nhantumbo and Macqueen 2003).

4.5.4 Fuzzy membership scores for the case MOZcp

Table 16 presents the fuzzy membership scores for the case MOZcp. The scoring is based on the above case description.

Table 16. Fuzzy membership scores for the case MOZcp.

Fuzzy set	Scores for case MOZcp
USE= USE_{NTFP} *USE_T	0.33
USE_{NTFP}	0.33
USE_T	0.33
MAN= MAN_M *MAN_E	0
MAN_M	0
MAN_E	0
EXC	0
TRA= TRA_{HH} +TRA_C	1
TRA_{HH}	-
TRA_C	1
DUR	1
SEC= SEC_O *SEC_B *SEC_H *SEC_C	1
SEC_O	1
SEC_B	1
SEC_H	1
SEC_C	1

4.6 Mainland Tanzania

4.6.1 The role of devolution in forest policy in Tanzania

The overall goal of Tanzania's National Forest policy is to enhance the contribution of the forest sector in the sustainable development of the country, and in the conservation and management of natural resources for the benefit of present and future generations (MNRT 1998). The policy objectives in relation to the devolution in the forest sector include the participation of all stakeholders in forest management and conservation through joint management agreements on central and local government forest reserves, defining clear ownership of forests and trees on public (non-reserved) forest land, and allocating forests and their management to villages, private individuals or the government. Central, local and village governments may demarcate and establish new forest reserves. Village forest reserves will be managed by village governments, or other entities designated by it for this purpose. The participation of local communities and other stakeholders in the conservation and management of natural protection forest and in watershed management and soil conservation through joint management agreements will be encouraged (MNRT 1998).

The Tanzania National Forest Programme (TNFP) is an instrument for implementing the National Forest Policy. Its ultimate goal is to reduce poverty and increase economic growth by managing forests sustainably without compromising environmental and cultural values.

Community and other stakeholder participation is a central theme in the TNFP, and a tool for reaching its overall goal. The TNFP for 2001-2010 is based on four implementation programmes that cover forest resources management and institutional and human resources development aspects. The programmes are: (1) Forest Resources Conservation and Management programme, which aims at promoting gender balanced stakeholder participation in the management of natural and plantation forests, giving priority to ecosystems conservation, catchment areas and sustainable utilisation of forest resources; (2) Institutions and Human Resources Development programme, which aims at strengthening institutional setup, coordination of forest management, establishing sustainable forest sector funding and improvement in research, extension services and capacity building through strengthening human resources; (3) Legal and Regulatory Framework programme, which focuses on the development of regulatory issues including the Forest Act, rules, regulations and guidelines to facilitate operations of the private sector and participatory management and (4) Forestry-Based Industries and Sustainable Livelihoods programme, which is intended to enhance forest industry development by promoting private sector investment, improving productivity and efficiency and to tap the income generation opportunities provided by non-wood forest products (MNRT 2001a).

Forest Resources Conservation and Management programme will be implemented through the following strategies: Participatory Forest Management (PFM), Joint Forest Management (JFM) and Community-Based Forest Management (CBFM) in buffer zones around protected forest reserves, increasing financial capacity of governments and villages through cost and benefit sharing on implementing JFM and CBFM, encouraging the sharing of management responsibilities in plantations and natural forests through management plans and coordination among different stakeholders in the forest sector (MNRT 2001a).

In 2003, the Forestry and Beekeeping Division (FBD) initiated a national programme for the implementation of PFM under the TNFP framework. The programme focuses on the implementation of PFM though increasing technical capacity and improving facilitation skills especially at the district level. In 2006, the programme was ongoing in 53 districts out of about 125 (FBD 2006)

The Forest Act (2002, in effect since 2004) provides the legal framework for implementing the National Forest Policy. One of the objectives of the Forest Act (2002) is to implement the national forest policy "to encourage and facilitate active participation of citizens in the sustainable planning, management, use and conservation of forest resources through the development of individual and community rights, whether derived from customary law or under this Act to use and manage forest resources." The Act also emphasises the delegation of forest resources management to the lowest possible level of local management.

Tanzania updated its strategy for poverty reduction in 2005. The new strategy, the "National Strategy for Growth and Reduction of Poverty" (United Republic of Tanzania 2005), recognises the importance of wildlife, forestry and fishery sectors for rural income generation and poverty reduction, and targets to increase these sectors' contribution to poverty reduction. The strategies for realising this target include scaling up participatory forest management to increase rural communities' incomes from natural resources management.

4.6.2 Forest lands and forest tenure

The land tenure in Tanzania is defined in the Land Act (1999) and Village Land Act (1999). All land in Tanzania is vested in the president, who acts as trustee on behalf of all citizens. The land laws recognise two types of land tenure: customary (deemed) rights of occupancy and granted right of occupancy. *Customary rights of occupancy* are based on using and occupying the land according to customary law and have no time limit. They can be held by an individual (Tanzanian citizen) or a group or community (of Tanzanian citizens). The law establishes procedures for obtaining customary right of occupancy. *Granted rights of occupancy* are normally granted by the government for a maximum of 99 years. According to the law, customary rights of occupancy and granted rights of occupancy have an equal status.

Most of the land in Tanzania is village land. Village land is the land area within villages' boundaries. There are about 12 000 village areas, i.e. land areas that are under village authorities (FBD et al. 2005). The Village Land Act (1999) lists several ways in which village land can be defined. Villages can apply for a Certificate of Village Land from the relevant district office. This certificate is approved by the Ministry of Lands (Lewis et al. 2003). It confirms which village area is managed by a certain village council.

Villages are responsible for the management of village lands, issuing individual land titles to people living in the village, and setting aside areas of village land for various purposes. Few villages have been surveyed and less than 100 villages have land certificates (FBD et al. 2005).

Village lands are divided into three categories: individual and family land, for which titles may be issued, communal village land, which is not available for individual occupation or use, and land set aside for future individual or communal use. Communal village land can be registered as common property owned together by villagers. Village Forest Reserves and Wildlife Management Areas can be established on communal village land (Alden Wily 2003).

Forest land in Tanzania is divided into two categories: forest reserves and unreserved land (general land/public land). Forest reserves have been gazetted either to protect special values or to ensure sustainable timber production. Forest reserves may be under the authority of districts, regions or the central government. About 13 million hectares (37% of the forests and woodlands) have been gazetted as forest reserves and are managed by the FBD in the Ministry of Natural Resources and Tourism. About 9 million hectares of this area are under production forestry, and 4 million hectares are managed as water catchment areas and soil protection areas without any licensed direct use. Local authorities manage about 0.6 million hectares of reserved forests (MNRT 2001a).

Non-reserved forest land includes all the land that is neither village land nor reserved forest. About 54% of natural forests and woodlands belong to unreserved land (covers app. 19 million hectares). A large part of this area is not under any ownership or proper management. It is under shifting cultivation, heavy pressure for conversion and rampant degradation. About 25% of the country's total area is designated as national parks, game reserves and game controlled areas (MNRT 2001a). In the law (Forest Act 2002), forests mean land with at least 10% tree crown cover, either natural or planted, or 50% shrub and tree regeneration cover. Forests are classified into *national forest reserves, local authority forest reserves, village forests* and *private forests*.

In Tanzania, the different forms of involving local people in forest management and conservation are generally called Participatory Forest Management. PFM was formalised in the Forest Act (2002). The law recognises two main types of PFM, community-based forest management and joint forest management. Community-based forest management is exercised on village lands either by the village (village land forest reserves) or a group of persons (community forest reserves). The great majority of community-based forest management is exercised on village land forest reserves (FBD 2006). Joint forest management is based on a management agreement between local communities and government authorities regarding the management of government land (village forest management areas). Until recently PFM has been implemented through a large number of donor supported local level projects. In the early projects, different approaches to strengthen community organisation and forest management were developed. After the drawing of the PFM guidelines (MNRT 2001b), they have usually been used to guide the implementation of PFM activities in the field. New guidelines, which address CBFM and JFM separately, have been drawn. The JFM guidelines have not yet been formally accepted (MNRT 2006, 2007).

Altogether PFM covers over 3.6 million hectares and involves 1 821 villages, which is 17.5% of the total number of villages. Community-based forest management covers over 2 million hectares and involves 1 102 villages. The number of declared or gazetted village land forest reserves is 382. Joint forest management is practiced in 208 forest reserves and it covers 1.6 million hectares, which is 11.6% of the national and local government forest reserves. The number of villages engaged in joint forest management is 719. Most forests under joint forest management are mountain forests (catchment forest areas), while the forests under community-based forest management are mostly woodlands (Blomley and Ramadhani 2007).

The Forestry and Beekeeping Division has drawn the Administrative and Financial Manual for implementing PFM and to contribute to the harmonising of donor efforts with those of the government under the forest sector-wide development approach. In this manual, districts are seen as the main facilitators of the programme. District councils' tasks include facilitating forest management planning in the villages, approving by-laws, issuing Village Land Certificates, declaration of village land forest reserves, capacity building in village institutions for effective forest management and conflict mediating (MNRT undated).

4.6.3 Devolution in forest management in Tanzania

Village land forest reserve (Case TANvfr)

Village land forest reserves can be established on village land. The Village Land Act (1999) provides a list of different ways in which a village can define its land area and status. For example, village land is the area described when the village was first registered, or the area agreed between a village council and village councils of the neighbouring villages. The village is the lowest government administrative unit in rural areas and it has a legal status **(SEC_H)**. Executive powers, e.g. the management of village lands, are vested with the village council.

Village councils hold common village land as a trustee of the villagers and are responsible for forest management on village lands **(DUR)**. The management duty can be allocated to an existing committee, or to a committee established for this purpose. Usually a village forest management committee or village natural resources committee is elected by the village

assembly. The village council is also authorised to arrange the management of a gazetted reserve through other arrangements agreed to by the village assembly. Two or more villagers can also manage forest reserves jointly (Forest Act 2002). District authorities support and assist communities in managing forest sustainably (MNRT 2006).

For formalising village land forest reserves villages need to draw forest management plans and by-laws **(MAN_M, USE_{NTFP}, USE_T)**. The draft management plan is drawn by the forest management/natural resources committee. The management plan describes the forest (location, size, boundaries, forest/vegetation types, condition, etc.), and states the objectives for putting the forest under community-based management **(SEC_B)**. It lists the responsibilities and powers of the village forest management committee and the records that will be kept relating to forest management, and sets out the principles for managing the funds related to forests management. The management plan includes rules, which set out the principles for the use of the reserve, e.g. which activities are forbidden, which require a licence and which are freely permitted for village members. The plan also describes all actions to rehabilitate and develop the reserve and how, when and by whom they will be undertaken, as well as the principles for monitoring the condition of the reserve (MNRT 2006).

The rules described in the management plan are not legally binding. To make legally binding rules regarding the village land forest reserve the village council is entitled to draw village by-laws. This is based on the Local Government (District Councils) Act (1982). Both the draft management plan and by-laws need to be accepted by the village assembly. Through the by-laws the village defines who is entitled to access and use the village forest reserve, and how or under what conditions this can be done **(EXC)**. The by-laws set the rules for forest management, protection and use, as well as the penalties for breaking the rules and procedures for handling offences.

The village council grants the permits for those uses that require a permit. Decisions concerning harvesting, licensing, and the collection of fees and fines are thus devolved to the village level. The villagers also have the right to establish and manage funds for developing the forest reserve. Amendments to the by-laws, which are not contrary to the spirit of the by-laws, may be accepted by the village assembly (MNRT 2006). The rights to village land forest reserve are subject to membership of the village. Rights cannot be alienated or transferred to non-members unless specific rules have been made to authorise it **(TRA_C)** (Forest Act 2002).

After the village assembly has agreed to declare a village forest reserve and has approved the management plan and by-laws, these documents need to be submitted to the district authorities for approval. The declared village land forest reserve is recorded in a register of village land forest reserves kept in the district **(SEC_O)** (Forest Act 2002).

The village council can apply for the forest reserve to be gazetted. The gazettment can be made only when the council has been managing the forest for at least three years. The Director of Forestry can agree to the gazettment subject to conditions regarding the management of the reserve. These conditions are binding. If the village council objects these conditions, it can withdraw the application for gazetting the reserve (Forest Act 2002). Gazettment does not alter the status or security of the reserve (MNRT 2006).

Declared village land forest reserves should be managed according to the Forest Act (2002), the accepted management plan and by-laws and other rules drawn by the village council, and customary rules and practices applicable to forest management in the area. The village council should also pay due regard to the notes of guidance regarding the management of village forest reserves, which the Director of Forestry may issue to villages (Forest Act 2002). This guidance includes the CBFM guidelines. Villages are issued a hammer mark to be used for marking the timber harvested, sold and transported from village land forest reserves (Forest Regulations 2004).

The state is not allowed to collect royalties from village land forest reserves or community forest reserves unless this has specifically been agreed on. Regulations regarding reserved tree species (list of conserved, commercially important or endangered tree species valid on general lands) are not valid on village land forest reserves, and they are exempted from local government taxes on forest produce (cees) (Forest Act 2002).

The model by-laws set the rules regarding forest management, protection and use, handling of offences, and handling of funds from fees and fines. Offences are first handled by village authorities **(MAN_E)**. Serious offences have to be dealt with in the District Courts. Land disputes are handled according to the Land Dispute Courts Act (2002). According to this law, Village Land Councils settle land related disputes at the village level. If a settlement is not found the dispute is referred to the Ward Tribunal (MNRT 2001b).

The district authority exercises general supervision over village councils in relation to the management of village land forest reserves. If the village council fails to manage the reserve and show a proper cause for the failure, the district authority can by resolution overtake the management functions. The village council can appeal on this decision to the ministerial level. If the reserve is gazetted, the Director of Forestry has the authority to revoke the reserve status (Forest Act 2002).

Village land can be transferred to general or reserved land for public interest. The public interest includes investments for national interests. The law does not specify what the public or national interests are in this connection. The affected villages and persons are entitled to compensation **(SEC_C).** Villages can also be given other land as compensation. The President may also transfer any reserved or general land to village land (Village Land Act 1999).

The Forest Act (2002) also recognises community forest reserves. They are managed by a sub-group of villagers instead of all villagers. A group of villagers can submit an application to the relevant village council for establishing a community forest reserve. This reserve can be separate or form a part of a village forest reserve. The village council makes the decision regarding the establishment of a community forest reserve taking into account the comments and recommendations of the district authority. However, the village council is not bound to follow them. The group is entitled to manage the community forest reserve according to the modalities agreed upon with the village council, and according to the village forest management plan prepared and adopted by the village council. The village council can also enact by-laws to facilitate the management of the community forest reserve (Forest Act 2002).

The declaration of both village land forest reserves and community forest reserves needs the full support of the whole village assembly. Village land forest reserve is then registered in a register of village forests with the relevant district. The district also keeps a list of all community forest groups formed in the district (Forest Act 2002). The establishment and management of community forest reserves are under the village council's general authority and responsibility. Because of this they are here not treated as a separate type of reserve.

In the implementation of PFM in Tanzania, the distinction between CBFM and JFM has been somewhat unclear. The new separate guidelines for CBFM and JFM aim to clarify the differences between these approaches. Usually PFM activities are initiated with the district facilitation team's visit to the village for raising villager awareness regarding forests and environment. The district facilitation teams have often tended to emphasise forest protection. Limiting access to the village forest and restricting the use of forests products have usually been the first activities in village forests. This has undermined the development of forest production activities and possibilities to contribute to the livelihood needs and villagers' priorities (FBD et al 2005).

Village forest management area (Case TANvma)

According to the draft JFM guidelines (MNRT 2007), JFM should encourage communities to participate in forest management though forest protection and patrol. As compensation communities are entitled to certain benefits. The target communities are those living in or next to forests.

A village has a legal status in Tanzanian legislation **(SEC_H)**. A village council can apply to manage the whole, or a part of national, or local authority forest reserve. The village assembly approves the application and establishes a committee for forest management, and approves the draft forest management plan and by-laws. The draft of a detailed management plan is included in the application for joint management.

In the case of national forest reserves, the draft management agreement and by-laws are sent to the FBD for comments and approval. District level approval is needed for local forest reserves. When a joint management agreement is made regarding a national forest reserve, the agreement will be made between the village council and the FBD. For the joint management of a local authority forest reserve, the agreement is made between the village council and the district council. The management is based on a written agreement, and the area is called the village forest management area **(SEC_O)** (Forest act 2002). If the forest is surrounded by many villages, the forest area can be divided into separate management areas for each village. Villages can also decide to manage the forest together as a single manager (MNRT 2007). Rights conveyed through the agreement are subject to membership in the village **(TRA_C)**.

The joint management agreement formalises the management arrangement, i.e. the roles and responsibilities of the village and the government. It includes a description of the forest, how management reponsibilities are shared, and the rules governing and regulating the access to and use of the forest reserve, and the collection of fees and fines and the management funds. It also states the duration and method for revision of the agreement and procedures for solving disputes. The agreement should be accompagnied by a map indicating the area of the reserve for which agreement applies and the location of the villages bordering the reserve **(SEC_B)**. The area under joint forest management is called Village Forest Management Area (VFMA)

(Forest Act 2002). JFM is based on local participation and sharing the right to use, manage and control forests (MNRT 2007).

Usually the joint forest management agreement includes the same information as the management plan and by-laws but is not as detailed. The agreement can be amended subject to mutal agreement. The JFM guidelines suggest that agreements are made for five years **(DUR)** (MNRT 2007). Current agreements are often made for a one year trial period, and then reviewed and amended if needed. Revised agreement is valid for five years, after which it is subject to renewal/re-negotiation according to the general planning cycle for national and local government forest reserves (every five years or other period prescribed in the law) (Forest Act 2002).

Every forest reserve must have a management plan. The forester responsible for the forest prepares the plan in consultation with the villages surrounding the forest. This plan defines the overall objectives of the forest management (protection or production) and the opportunities for harvesting forests products. A more detailed management plan is drawn for each village forest management area. It describes the boundaries of the VFMA, states who is responsible for managing the VFMA, how it should be protected and used, how management responsibilities and benefits are shared between the government and the village, how offences are dealt with, and how the management is monitored **(MAN_M)**. In areas where harvesting of forest products is possible, management planning should be based on participatory forest resources assessment. This will form the basis for management (MNRT 2007). In practice, community participation and the role of district officers in forest assessment and management planning processes have varied considerably between projects (Hansen and Østergaard 2004).

Villages need to develop by-laws to be able to enforce the forest management agreement. By-laws need to be drawn and accepted according to the Local Government Act as described above. The content of the by-laws is similar to that of the by-laws described in relation to village land forest reserves above. They define e.g. who is authorised to use the resources. Based on the by-laws village can fine and arrest violators **(EXC, MAN_E)**.

There are no legally binding regulations regarding the sharing of responsibilities and benefits in JFM. However, the JFM guidelines suggest that in the protection forests the main activities for which the villages are responsible are law enforcement, patrolling and reporting illegal activities, fire fighting and prevention, and meetings in relation to forest mangement, and monitoring and reporting. In addition to the responsibilities in protection forests, enrichment planting and supervising harvesting operations are included in the villages' responsibilities in production forests (MNRT 2007).

In protection forests, timber harvesting is principally not permitted. In these forests the agreements allow only limited utilisation, e.g. water collection, access to forest for beekeeping and fishing, collection of dead wood for fuel wood, and collection of vegetables, fruits, mushrooms, medicinal plants, fibres and grass. In some cases grazing or limited harvesting of timber for village infrastructure development is possible. Harvesting from boundary strips planted around the forest is also permitted. Villages are entitled to 100% of the fines from offences, 50% of the entry, camping etc. fees and 50% of the value of the confiscated forest products **(USE_{NTFP}, USE_T)**.

In production forests, villagers share the benefits with the government according to the joint management agreement. In addition to the benefits from production forests mentioned above, villagers are entitled to a share of timber royalties. The JFM Guidelines suggest that the villagers' share of royalties should be 40%, however this is not legally binding (MNRT 2007).

Disputes regarding the joint forest management agreement are first reported to the district authorities and a request for an independent mediator is made. If he fails to resolve the issue, the matter will be taken to the Director of Forestry and Beekeeping. If mediation fails, the matter will be taken to the court of law (MNRT 2007).

Some existing agreements state that the Director of Forestry and Beekeeping is entitled to terminate the agreement or make amendments, if there are weaknessess in the implementation of the plan (Kitapilimwa Government Forest… 2001, North-Nyang'oro woodlands…2001).

The Minister may by an order published in the National Gazette cancel the declaration of any forest reserve, or alter the status of a production or protection forets, or a nature reserve. If this causes a loss or diminuation of rights, the right holders need to be fully compensated **(SEC_C)** (Forest Act 2002).

In practice, especially due to the logging ban in the catchment forests, the use of forests under JFM agreements has been limited, leading to very few benefits from forest products. Usually villagers are allowed to collect fuel wood, medicinal plants, mushrooms, wild vegetables and fruits, honey, and wax for domestic use. The harvesting of NTFPs, beekeeping and using the forest for tourism activities can be subject to permits issued by the village natural resources management committee (or village forest management committee). In many cases, civil servants retain control over the resource use and permits (Lewis et al. 2003).

The income from fees and fines can be used for the development of the forest. Extra income can be used for village development activities. The village can also be required to pay royalties from the forest income to the district council (Veltheim and Kijazi 2002). In some cases, these royalties have been 25% of the income (North-Nyang'oro woodlands…2001). In other areas, all forest income is divided equally between the villages involved in a JFM agreement (Kitapilimwa Government Forest… 2001, West Kilombero Forest…2002).

A large part of the forest income is based on fines. When forests are under effective village control, illegal forest use is reduced. This decreases the income for forest managers and causes problems in covering the forest management and protection costs (Blomley and Ramadhani 2004).

4.6.4 Fuzzy membership scores for the cases TANvfr and TANvma

The fuzzy membership scores for the cases TANvfr and TANvma are presented in Table 17. The scoring is based on the above case descriptions.

Table 17. Fuzzy membership scores for cases TANvfr and TANvma.

Fuzzy set	Scores for case TANvfr	Scores for case TANvma
USE= USE_{NTFP} *USE_T	1	0.33
USE_{NTFP}	1	0.67
USE_T	1	0.33
MAN= MAN_M *MAN_E	1	0.33
MAN_M	1	0.33
MAN_E	1	1
EXC	1	0.67
TRA= TRA_{HH} +TRA_C	1	1
TRA_{HH}	-	-
TRA_C	1	1
DUR	1	0.33
SEC= SEC_O *SEC_B *SEC_H *SEC_C	1	0.67
SEC_O	1	0.67
SEC_B	1	1
SEC_H	1	1
SEC_C	1	1

5 ANALYSES AND RESULTS

5.1 Fuzzy set analyses

5.1.1 Devolved use rights

The fuzzy set for use rights is a combined set consisting of two sub-sets: the sub-set for use rights regarding NTFPs and the sub-set for use rights regarding timber. The fuzzy membership scores for the combined set and the sub-sets as well as the cases with the respective membership score (case IDs) are presented in Table 18.

Table 18. Fuzzy membership scores for use rights to NTFPs (USE_{NTFP}) and timber (USE_T) and for the combined set (USE).

Fuzzy membership score	**USE_{NTFP}**		**USE_T**		**$USE=USE_{NTFP}*USE_T$**	
	Number of cases	Case IDs	Number of cases	Case IDs	Number of cases	Case IDs
1	5	LAOal, NEPcf, NEPlf, VIEcf, TANvfr	3	LAOal, NEPcf, TANvfr	3	LAOal, NEPcf, TANvfr
0.67	5	LAOvf, VIEal, VIEcon, KENcp, TANvma	5	NEPlf, VIEal, VIEcon, VIEcf, KENcp	5	NEPlf, VIEal, VIEcon, VIEcf, KENcp
0.33	1	MOZcp	3	LAOvf, MOZcp, TANvma	3	LAOvf, MOZcp, TANvma
0						

The use rights regarding NTFPs are generally more comprehensive than the use rights regarding timber. In ten cases, the use rights to NTFPs are either comprehensive or rather comprehensive, indicating that subsistence use and at least restricted commercial use of NTFPs are allowed. Only in one case (MOZcp), do the rights allow only subsistence use of NTFPs.

Devolved rights allow commercial and subsistence use of timber in three cases (LAOal, NEPcf, TANvfr). Subsistence use with restricted commercial use is possible in five cases (NEPlf, VIEal, VIEcon, VIEcf, KENcp). In tree cases only subsistence use of timber is allowed (LAOvf, MOZcp, TANvma).

The combined set USE is formed from the sub-sets by combining them with the operation "logical and". The fuzzy membership scores for the use rights to timber are for each case the same or lower than the use rights to NTFPs. Because of this, the fuzzy membership scores in the combined set are the same as for the use rights to timber (for the principles of combining fuzzy sets see Chapter 3.2). The fuzzy membership scores in the combined set for devolved use rights range from rather restricted to comprehensive. In eight cases (out of eleven), the devolved use rights are either comprehensive (LAOal, NEPcf, TANvfr) or rather comprehensive (NEPlf, VIEal, VIEcon, VIEcf, KENcp). In these cases, the rights allow

subsistence use and at least restricted commercial use of forest products. In three cases, use rights allow only subsistence use of forest products (LAOvf, MOZcp, TANvma).

5.1.2 Devolved management rights

The fuzzy set for management rights consists of two sub-sets: rights to decide on the harvesting, management and development (MAN_M) of the resource, and rights to enforce rules, monitor resource use and sanction violators (MAN_E). The fuzzy membership scores in the sub-sets and in the combined set are presented in Table 19.

Table 19. Fuzzy membership scores for sub-sets of management rights (MAN_M, MAN_E) and for the combined set (MAN).

Fuzzy membership score	**MAN_M**		**MAN_E**		**$MAN=MAN_M * MAN_E$**	
	Number of cases	Case IDs	Number of cases	Case IDs	Number of cases	Case IDs
1	2	NEPcf, TANvfr	6	LAOvf, NEPcf, NEPlf, VIEcf, TANvfr, TANvma	2	NEPcf, TANvfr
0.67	1	NEPlf			1	NEPlf
0.33	6	LAOal, LAOvf, VIEal, VIEcf KENcp, TANvma	1	KENcp	6	LAOal, LAOvf, VIEal, VIEcf, KENcp, TANvma
0	2	VIEcon, MOZcp	1	MOZcp	2	VIEcon, MOZcp
Missing			3	LAOal, VIEal, VIEcon		

The fuzzy membership scores for the sub-sets of rights to decide on the harvesting, management, and transformation of the resources range from restricted to extensive. In two cases, these rights are extensive (NEPcf, TANvfr), and in one case, rather extensive (NEPlf).

In most cases (LAOal, LAOvf, VIEal, VIEcf, KENcp, TANvma), these rights are rather restricted and the holder only participates in the decision making regarding the harvesting, management and transformation of the resource. In two cases (VIEcon, MOZcp), these rights are restricted and the right holder has a limited role in the decision making.

The rights to enforce rules, monitor resource use and sanction violators are generally more extensive than the other management rights. In six cases, right holders are devolved the rights to enforce rules, monitor resource use and sanction violators. In one case, these rights are rather restricted (KENcp), and in one case (MOZcp) restricted. In cases where rights are devolved to individual households (LAOal, VIEal, VIEcon), the rights to enforce rules, monitor resource use and sanction violators are not relevant and coded missing.

The fuzzy membership scores in the combined set of management rights (MAN) range from restricted to extensive rights. In two cases, the right holders have only a limited role in the decision making regarding the harvesting, management and transformation of the resource and enforcing the rules, monitoring use, and sanctioning violators (VIEcon, MOZcp). In six cases (LAOal, LAOvf, VIEal, VIEcf, KENcp, TANvma), the membership score is 0.33, indicating that the right holder participates in the decision making. In one case, the right holder has an important role in the decision making (NEPlf). Only in two cases, extensive management rights are devolved to the local level (NEPcf, TANvfr).

5.1.3 Devolved exclusion rights

The membership scores in the fuzzy set of exclusion rights are presented in Table 20.

Table 20. Fuzzy membership scores in the set of exclusion rights (EXC).

Fuzzy membership score	Number of cases	Case IDs
1	7	LAOal, NEPcf, NEPlf, VIEal, VIEcon, VIEcf, TANvfr
0.67	1	TANvma
0.33	2	LAOvf, KENcp
0	1	MOZcp

The right to exclude others from accessing and using the resources is the principal right that distinguishes any resource management system from open access. Exclusion rights have been devolved to the local level in seven cases. In these cases, the right holder has full rights to exclude all others, also state sanctioned users. In one case (TANvma), the right holder has an important role in the decision making regarding the allocation of rights to outsiders. In two cases (LAOvf, KENcp), the right holder participates in the decision making regarding the allocation of rights. In one case (MOZcp), the right holder has a limited role in the decision making when rights are allocated to others.

5.1.4 Devolved transfer rights

The set of transfer rights (TRA) consist of the sub-sets of transfer rights for households (TRA_{HH}) or transfer rights to communities (TRA_{C}). Table 21 presents the fuzzy membership scores in the sub-sets and for the combined set.

Table 21. Membership scores in the set of transfer rights (TRA).

Fuzzy membership score	TRA_{HH}		TRA_C		$TRA=TRA_{HH} + TRA_C$	
	Number of cases	Case IDs	Number of cases	Case IDs	Number of cases	Case IDs
1	1	LAOal	6	LAOvf, NEPcf, VIEcf, MOZcp, TANvfr, TANvma	7	LAOal, LAOvf, NEPcf, VIEcf, MOZcp, TANvfr, TANvma
0.67	1	VIEal			1	VIEal
0.33	1	VIEcon			1	VIEcon
0			2	NEPlf, KENcp	2	NEPlf, KENcp

For villages and community groups, this fuzzy set is a crisp set consisting of cases, which are either fully in (with right to bequeath) or fully out (without right to bequeath). In six out of eight cases, rights can be bequeathed. These cases have a full membership in this set. Only in two cases, rights to bequeath are either unclear (NEPlf) or do not exist (KENcp).

For cases where rights are devolved to individuals or households (LAOal, VIEal, VIEcon), this set is a fuzzy set. Full transfer rights include the rights to sell, lease, use as collateral and bequeath. Only one case (LAOal), has a full membership in this set. In one case (VIEal), transfer rights depend on forest classification and the state of the forest at the time of allocation; only planted production forest and land for afforestation can be sold. In one case (VIEcon), the rights can only be bequeathed.

The combined set of transfer rights is formed by combining the sub-sets with "logical or" (for the principles of combining fuzzy sets see Chapter 3.2). Seven cases have full membership scores in the combined set, which for households indicate full transfer rights and for community groups rights to bequeath. Two cases are fully out of the set indicating that in these cases there are no transfer rights. In one case transfer rights are rather full and in one case rather restricted.

5.1.5 Duration of devolved rights

The fuzzy membership scores in the set of duration of rights are presented in Table 22.

Table 22. Fuzzy membership scores in the set of duration of rights (DUR).

Fuzzy membership score	Number of cases	Case IDs
1	4	LAOal, NEPcf, MOZcp, TANvfr
0.67	4	NEPlf, VIEal, VIEcon, VIEcf
0.33	2	LAOvf, TANvma
0	1	KENcp

The devolved rights range from very short term rights to perpetually held rights. In three cases (KENcp, LAOvf, TANvma), the duration of rights is very or rather short. In these cases, the rights are based on contracts made for three (KENcp) or five years (LAOvf, TANvma), respectively. In eight cases, rights are devolved for rather long term or without a time limit. Rather long term rights range from forty (NEPlf) to fifty/seventy years (VIEal, VIEcon, VIEcf). In cases where the rights are devolved for a specific time, they are usually renewable or can be extended. The only exception is forestland contracted under long term contracts to individuals and households in Vietnam (VIEcon). The legislation does not say anything about extending or renewing these contracts. In four cases, the devolved rights are held perpetually (LAOal, NEPcf, MOZcp, TANvfr).

5.1.6 Security of devolved rights

The fuzzy set for security of rights consists of four sub-sets: the origin of rights (SEC_O), the clarity of the boundaries (SEC_B), the clarity of right holder (SEC_H), and the rights to receive compensation (SEC_C). The membership scores in the sub-sets and in the combined set are presented in Table 23.

Table 23. Fuzzy membership scores for the sub-sets (SEC_O, SEC_B, SEC_H, SEC_C) and for the combined set of security of rights (SEC).

Fuzzy member-ship score	**SEC_O**		**SEC_B**		**SEC_H**		**SEC_C**		**$SEC=SEC_O*SEC_B*SEC_H*SEC_C$**	
	No. of cases	Case IDs	No. of cases	Case IDs	No. of cases	Case IDs	No. of cases	Case IDs	No. of cases	Case IDs
1	5	LAOal, VIEal, VIEcf, MOZcp, TANvfr	11	LAOal, LAOvf, NEPcf, NEPlf, VIEal, VIEcon, VIEcf, KENcp, MOZcp, TANvfr, TANvma	9	LAOal, LAOvf, NEPcf, VIEal, VIEcon, KENcp, MOZcp, TANvfr, TANvma	10	LAOal, LAOvf, NEPcf, NEPlf, VIEal, VIEcon, VIEcf, MOZcp, TANvfr, TANvma	4	LAOal, VIEal, MOZcp, TANvfr
0.67	6	LAOvf, NEPcf, NEPlf, VIEcon, KENcp, TANvma			1	VIEcf			5	LAOvf, NEPcf, VIEcon, VIEcf, TANvma
0.33					1	NEPlf			1	NEPlf
0							1	KENcp	1	KENcp

In five cases, the legal framework enables the right holder to acquire a formal title or certificate as an indication of the state recognition of rights (LAOal, VIEal, VIEcf, MOZcp, TANvfr). In the other cases, rights are based on formal contracts (LAOvf, NEPlf, VIEcon, KENcp, TANvma) or forest legislation (NEPcf). In all cases, the legal framework includes statements presupposing that the boundaries of the area to which the rights apply are clearly defined.

The right holder is clearly defined and has a legal status in nine cases. In one case (VIEcf), the right holder is clearly defined, but is not recognised as a legal entity. In one case (NEPlf), the right holder is not clearly defined in the legislation.

In almost all cases, the right holder is, according to the law, entitled to compensation if the rights are either fully or partly cancelled, or withdrawn. Only in Kenya is the situation unclear. The Forests Act (2005) sets the terms under which a management agreement can be terminated, but is silent about compensating community associations. Also, the conditions under which state and local forests can be excised, or their boundaries altered, emphasise environmental and conservation issues, but do not mention the possible rights of local people.

The fuzzy membership scores in the combined set of security of rights range from insecure rights (KENcp) to secure rights. In one case, the rights are rather insecure (NEPlf). In most cases, rights are either rather secure (LAOvf, NEPcf, VIEcon, VIEcf, TANvma) or secure (LAOal, VIEal, MOZcp, TANvfr).

5.2 Qualitative Comparative Analysis for developing an empirical typology

The grouping of the cases is based on the fuzzy set analysis. For QCA the fuzzy membership scores are first transferred into a crisp set truth table. The fs/QCA programme (Ragin et al. 2006) is used for transferring the fuzzy set information into a crisp set truth table and for minimising the truth table to find the minimal number of combinations that describe the diversity within the cases. These combinations define the major types represented in the data. The QCA analysis concentrates on the diversity between the cases, not on the features that they have in common. Thus, the results are based on the attributes, which best describe the differences between the cases.

The crisp set truth table obtained by transferring the fuzzy sets into a crisp sets is presented in Appendix 4. Table 24 presents the same information in a more concise format. Cases represented with the same truth table row, i.e. which have the same crisp set values in each set, are in this table combined. The cases represented by each row are listed in the last column. As can be seen from the distribution of cases within the truth table rows, the cases are very diverse. Six of the rows represent only one case each.

Table 24. Crisp set truth table based on the six original attributes of rights, use, management, exclusion, transfer, duration and security.

USE	MAN	EXC	TRA	DUR	SEC	Cases	Number of cases
1	0	1	1	1	1	LAOal, VIEal, VIEcf	3
1	1	1	1	1	1	NEPcf, TANvfr	2
0	0	0	1	0	1	LAOvf	1
0	0	0	1	1	1	MOZcp	1
0	0	1	1	0	1	TANvma	1
1	0	0	0	0	0	KENcp	1
1	0	1	0	1	1	VIEcon	1
1	1	1	0	1	0	NEPlf	1

The minimised solution for the equation USE*MAN*EXC*TRA*DUR*SEC = > OUT produced by the Quine-McCulsky algorithm is the following:

Groups and respective solution terms:	Covers cases:
(1) use*man*TRA*dur*SEC +	LAOvf, TANvma
(2) use*man*exc*TRA*SEC +	LAOvf, MOZcp
(3) USE*man*EXC*DUR*SEC +	LAOal, VIEal, VIEcon, VIEcf
(4) USE*EXC*TRA*DUR*SEC +	LAOal, NEPcf, VIEal, VIEcf, TANvfr
(5) USE*man*exc*tra*dur*sec +	KENcp
(6) USE*MAN*EXC*tra*DUR*sec	NEPlf

The solution terms (1-6) define the different types of cases represented in the data. The uppercase letters indicate that the attribute is present and lowercase letters that it is absent. Due to the large diversity within the cases and the relatively high number of attributes in relation to the number of cases there is overlapping between the minimised solution terms. It does not clearly differentiate between the different types of cases within the data. In order to produce a more simplified grouping, to better differentiate between the groups and to avoid overlapping, the number of attributes in the analysis is reduced. This is done by creating a new fuzzy set "control rights", by combining the fuzzy sets for management (MAN) and exclusion (EXC) rights. This new sets presents the right holders' capacity to control who can access and benefit from the resource (exclusion), and how the resource is managed and developed (management). The membership scores in the combined set, formed through the operation of "logical and", are the minimum membership scores of each case in the sets that are combined. The fuzzy membership scores for each case in the original sets in the combined fuzzy set as well as the respective crisp set scores are presented in Table 25.

Table 25. The membership scores of each case in the combined set of control rights (CON).

Case	MAN	EXC	CON=MAN*EXC	
			fuzzy set value	crisp set value
LAOal	0.33	1	0.33	0
LAOvf	0.33	0.33	0.33	0
NEPcf	1	1	1	1
NEPlf	0.67	1	0.67	1
VIEal	0.33	1	0.33	0
VIEcon	0	1	0	0
VIEcf	0.33	1	0.33	0
KENcp	0.33	0.33	0.33	0
MOZcp	0	0	0	0
TANvfr	1	1	1	1
TANvma	0.33	0.67	0.33	0

The crisp set truth table based with the five attributes of rights (use, transfer, duration, security and control) is presented in Table 26.

Table 26. Crisp set truth table with five attributes of rights: use, transfer, duration, security and control.

USE	TRA	DUR	SEC	CON	Cases	Number of cases
1	1	1	1	0	LAOal, VIEal, VIEcf,	3
0	1	0	1	0	LAOvf, TANvma	2
1	1	1	1	1	NEPcf, TANvfr	2
0	1	1	1	0	MOZcp	1
1	0	0	0	0	KENcp	1
1	0	1	0	1	NEPlf	1
1	0	1	1	0	VIEcon	1

With this truth table, the minimised solution for the equation USE *TRA*DUR*SEC*CON = > OUT is the following:

Groups and respective solution terms:	Covers cases:
(1) use*TRA*SEC*con +	LAOvf, MOZcp, TANvma
(2) USE*DUR*SEC*con +	LAOal, VIEal, VIEcon, VIEcf
(3) USE*TRA*DUR*SEC +	(LAOal), NEPcf, (VIEal, VIEcf), TANvfr
(4) USE*tra*dur*sec*con +	KENcp
(5) USE*tra*DUR*sec*CON	NEPlf

1) *Restricted use and control rights* (LAOvf, MOZcp, TANvma). The first group is defined by restricted use (use) and control (con) rights. The rights for this group are secure (SEC) and subject to village or community membership and thus implicitly inheritable (TRA). This group covers village forestry in Laos, community participation in Mozambique and village forest management areas in Tanzania. In village forestry in Laos and in village forest management areas in Tanzania the rather

short term rights are based on agreements between forest authorities and villages. Decisions regarding the use and management of the resource are made in cooperation with the forest authorities. In Mozambique, local communities can formalise their rights to the land they have occupied according to customary norms and practices and apply for a land title. However, the title conveys to communities only rights to subsistence use forest products. For commercial utilisation communities compete for licenses and concessions with others, and as they lack capital and technical expertise they are in fact in a weaker position than commercial actors. In Mozambique, communities should be consulted when licences and concessions are granted. Consultations aim at securing benefits for communities in the form of employment and infrastructure development.

2) *Extensive use rights but restricted control rights* (LAOal, VIEal, VIEcon, VIEcf). The second group is defined by long term (DUR), secure (SEC), extensive use rights (USE), but restricted control (con) rights. This group covers land allocation in Laos as well as land allocation, contracting forest land and community forestry in Vietnam. Through land allocation households in Laos, and households and communities in Vietnam can in principle obtain long term use rights to forest land. In Laos, land allocation to households is subject to quite detailed use targets. In Vietnam, forest legislation gives detailed prescriptions on how forests in different forest categories should be used and managed. In addition, contracted forest land should be used according to the contract terms.

3) *Extensive rights* (NEPcf, TANvfr). The third group is defined by long term (DUR), secure (SEC) and extensive use (USE) and transfer (TRA) rights. This group includes land allocation to households in Laos and Vietnam, as well as community forestry in Nepal and Vietnam and village forest reserves in Tanzania. It overlaps with the previous group (2). However, land allocation in Laos and Vietnam and community forestry in Vietnam fit better in the group 2, especially because in all these cases control rights are rather restricted (con). On the other hand, control rights are extensive (CON) in community forestry in Nepal and in village forest reserves in Tanzania. The third group can thus be defined by extensive rights; it includes community forestry in Nepal and village forest reserves in Tanzania. All the analysed attributes of rights are extensive in these two cases.

4) *Insecure, short term use rights and restricted control rights* (KENcp). The fourth group covers only one case, community participation in Kenya. The group is defined by insecure (sec), short term (dur) extensive use (USE) rights and restricted control (con) and transfer (tra) rights. Rights are based on a short term management agreement drawn between a forest association and forest authorities. The membership in a forest association is not inheritable.

5) *Insecure, extensive rights* (NEPlf). Also the fifth group covers only one case, leasehold forestry in Nepal. It is defined by long term (DUR), extensive use (USE) and control (CON) rights, but these rights are not fully secure (sec) and they are not transferable (tra). Rights are based on a lease, but no fees are collected.

5.3 Comparing the cases to the ideal type

The ideal type against which the cases are analysed is defined on the basis of the theoretical discussion. The ideal type represents a situation where the rights holder has been devolved comprehensive use rights (USE), extensive management (MAN), exclusion (EXC) and transfer (TRA) rights. In addition these rights can be held perpetually (DUR) and they are secure (SEC). The ideal type can thus be defined as USE*MAN*EXC*TRA*DUR*SEC.

The different attributes of property rights are all considered to be equally important. The effects of property rights on the incentives for sustainable management of forest resources as well as the opportunities for forest-based local level development are based on the combination of these attributes. The cases are seen as wholes consisting of the different attributes of rights. The ideal type analysis is based on the fuzzy set analysis. Each cases' membership score in the combined set that represents the ideal type is the product of the "logical and" -operation described in Chapter 3.2. This means that the membership score for the combined set is the same as the lowest membership score in the fuzzy sets that are combined. The rights are thus no stronger than the weakest attribute of the rights.

Each case study's conformity to the ideal type is presented in Table 27. Generally, the membership scores in the ideal type are low. Four cases are fully out (NEPlf, VIEcon, KENcp, MOZcp) and five cases more out than in (LAOal, LAOvf, VIEal, VIEcf, TANvma) of the combined set representing the ideal type. Only two cases are either fully in, or more in than out of the ideal type (NEPcf and TANvfr).

Table 27. Case studies' conformity to the ideal type, according to the legal framework.

Case	USE	MAN	EXC	TRA	DUR	SEC	USE*MAN*EXC*TRA*DUR*SEC
LAOal	1	0.33	1	1	1	1	0.33
LAOvf	0.33	0.33	0.33	1	0.33	0.67	0.33
NEPcf	1	1	1	1	1	0.67	0.67
NEPlf	0.67	0.67	1	0	0.67	0.33	0
VIEal	0.67	0.33	1	0.67	0.67	1	0.33
VIEcon	0.67	0	1	0.33	0.67	0.67	0
VIEcf	0.67	0.33	1	1	0.67	0.67	0.33
KENcp	0.67	0.33	0.33	0	0	0	0
MOZcp	0.33	0	0	1	1	1	0
TANvfr	1	1	1	1	1	1	1
TANvma	0.33	0.33	0.67	1	0.33	0.67	0.33

Allocation of use rights in Laos (Case LAOal)

In principle, the legal framework in Laos enables individuals and households to acquire long term use rights to degraded or bare forestland. The allocation of land is conditioned by the individuals/households labour and financial capacity to plant and rehabilitate the land. After acquiring a title for long term use, the rights include comprehensive use rights and full exclusion and transfer rights. The rights are held perpetually and they are secure. However, the devolved rights include only rather restricted management rights. The land needs to be used and managed for a specific purpose and according to the given objectives.

The membership score in the ideal type is 0.33, indicating that the case is more out than in from the combined fuzzy set representing the ideal type USE*MAN*EXC*TRA*DUR*SEC. It has full membership in all other sets except the set of management rights. The management rights are rather restricted.

In practice, the security of rights is largely undermined by the unclear status of land use rights. In the land allocation process, farmers are issued temporary land use certificates, which are valid for three years. After using the land according to the land use contract forming part of the certificate, the land user is entitled to a long term use right. In practice, temporary certificates have not been transferred to long term use rights, and in many cases the temporary rights have expired. Unofficial transfers of temporary certificates have further complicated the situation. Officially, temporary certificates can be inherited, but they cannot be sold or leased. Transfers of temporary use rights are not officially recognised, and new holders cannot use temporary certificates, which are written to another name, as evidence of land use right.

Village forestry in Laos (Case LAOvf)

Villages' rights to use and manage forest land are based on a management agreement. It confirms the allocation of land for village management, and defines the area, location, general management objectives and utilisation of different forest categories of the village forest. It conveys to villages the rights to protect, use and benefit from the forest according to the agreement. Agreements are valid for five years. Management plans and rules concerning the management and use of forest land and resources in the village area are drawn in cooperation with district authorities, and approved at the district level. Large areas of the forest land allocated to villages have been categorised as conservation, protection and regeneration forest, where utilisation is restricted. For villages the commercial utilisation of timber from production forests has also basically been prohibited. In general, villages have rights to subsistence use forest products and to restricted commercial use of NTFPs mainly from village production forests.

Villages have the rights to participate in the planning, management and benefit sharing in production forest areas when village forests are included in the established Production Forest Areas. This enables villages to participate in and benefit from the commercial utilisation of forest products within these areas. Participation is based on another agreement between a village forest organisation and Forest Management Unit established for the management of each PFA. These agreements state the rights and responsibilities of each party in the implementation of PFA management and revenue generation. FMU makes the management decisions after consulting village organisations, and implements management plans with villages' participation. The allocation of harvesting quotas is done at the provincial level. Village representatives have the right to participate in the decision making regarding timber sales, but they cannot prevent commercial harvesting within village production forests. Village forest organisations organise teams to conduct field operations, i.e. provide labour for implementing forest management and harvesting activities. A small part of timber revenues is directed to village funds.

For this case the use, management and exclusion rights are rather restricted, and the rights are held for a rather short term, but they are rather secure. The membership score in the combined set is 0.33, indicating that the case is more out than in the combined fuzzy set representing the ideal type.

Villagers should participate in the land use planning and land allocation process, and in the drafting of forest management plans and village regulations. In practice, land use planning has been implemented with varying degrees of participation. There has also been confusion regarding the different forest categories and villagers' use rights in different forest categories. In some cases, village regulations have been pre-defined and only brought to village authorities for signing. This undermines villagers' possibilities to decide on the use and management of forest resources within the village area.

When village forests are located within PFAs, the village representatives should be able to participate in the decision making regarding timber sales. However, in practice timber sales have been conducted in the provinces without village representatives' participation. The government has also collected most of the revenues from timber sales leading to low level of benefits to communities.

Community forestry in Nepal (Case NEPcf)

According to the Nepalese forest legislation, any part of national forest can be handed over to a registered community forest user group for development, conservation and utilisation for collective benefit. The CFUG is responsible for the preparation of an operational plan for the community forest area. District forest officers are required to provide technical and other support in drawing operational plans, which also need to be approved at the district level. CFUGs are entitled to manage forest and harvest, sell and distribute forest products according to the approved operational plan. Community forests should be used to satisfy the basic needs of the user group members. Surplus products can be sold outside the group.

This case's membership score in the ideal type is 0.67, indicating that the case is more in than out of the combined fuzzy set that represents the ideal type. It has full membership in all sets except the set of secure rights. The rights are based on law and the membership score in the fuzzy set of secure rights is thus 0.67, indicating that the rights are rather secure.

In practice, the rights to use and mange community forests are more restricted than the legislation implies. The rights are tied to the approved operational plan. The drawing and renewal of operational plans is subject to a detailed forest inventory and district approval. Because of the limited capacity of the user groups and even district officers to conduct required inventories, the renewal of operational plans has been delayed, and the handing over of new community forests has slowed down. Difficulties and delays in the drawing and renewing of operational plans limit the duration of the rights to the time span of the approved operational plan, i.e. normally to five years.

The legislation allows commercial utilisation of forest products, including timber. In practice, most forests handed over to user groups have been degraded. CFUG activities have concentrated on the protection and improvement of forests, allowing only subsistence use of forest products. CFUGs are not managing community forests to the full potential. Overall, community forest management has been protection oriented, but improved forest condition has created new possibilities for commercial utilisation of forest. Policy makers and forest authorities have not yet reached consensus on the role of commercial utilisation of community forests. Commercial utilisation has been made difficult by requesting user groups to follow

complicated requirements in order to harvest and market timber. District authorities have also not approved operational plans that have included timber sales outside the user group.

Leasehold forestry in Nepal (Case NEPlf)

Leasehold forests are handed over to communities living below the poverty line for forty years. The criteria for leasehold group membership are not defined in the legislation, and there are no procedures for officially establishing and registering these groups. The rights of the leasehold group are based on a contract between the group and district authorities. The leasehold does not recognise the rights of individual/household members, and the rights to bequeath are not clear. The leasehold group needs to prepare a five year operational plan. However, a leasehold group's management rights do not fully cover the trees existing in the leasehold area. These trees belong to the state, and the leasehold group should include in the operational plan measures for protecting and managing these trees. Leasehold groups are entitled to NTFPs and timber from trees, which have been planted by the group.

With a membership score 0, this case is fully out of the combined set representing the ideal type. The transfer rights are unclear and the rights are rather insecure, because the right holder is not clearly defined in the legislation.

The rights to the leasehold area are granted exclusively to the leasehold group. This has created conflicts within communities when community members who have previously used the area handed over to the leasehold group have refused to respect the group's rights. Leasehold groups have had serious problems in enforcing their rights against others and in excluding non-members from the leasehold area.

Forest land allocation in Vietnam (Case VIEal)

Households and individuals can be allocated protection and production forest land, generally for fifty years. After allocation, land users are entitled to a land use certificate (Red Book), which is a proof of the state recognition of the rights. The rights to transfer depend on the classification and state of the forest. The rights to use and manage also depend on the classification of the forest and the state of the forest at the time of allocation. The land user has to use the land for a specified purpose and according to detailed use and management prescriptions given in different decrees and decisions. The benefit sharing between the land recipient and the state depends on the classification of the forest, the state of the forest at the time of allocation, and on who has invested in planting. In principle, the land users are entitled to enjoy the results of their own labour and investments, but the decrees and decisions give detailed prescriptions on how the harvesting of different products should be done. The rights of the land holder are most extensive when the allocated forest land is production forest land without forest cover and the land holder invests his/her own labour and funds in afforestation or planting the forest. The land holders' rights to make management and harvesting decisions and benefit from the resource are most restricted when the forest land is protection forest with natural forest. This case is more out than in of the ideal type, because of the rather restricted management rights. Its membership score in the combined set representing the ideal type is 0.33.

In practice, there are often long delays before land use certificates are issued. Many farmers do not have any proof of their land use right, which undermines the security of rights and prohibits the transfer of rights. The allocated forest plots have also been much smaller (on average 3 hectares) than the maximum stated in the law (25-30 hectares). The procedures for acquiring permits for harvesting are complicated and vary between provinces. Benefit sharing and the rights to use forest products depend on the forest classification. Unclear distinction between protection and production forests has undermined benefit sharing and land users' rights to use and manage the forest. The benefit sharing in allocated areas is based on very complicated calculations, which are difficult for the local people to understand. This applies also to the contracted forest land discussed below.

Contracted forest land in Vietnam (Case VIEcon)

State Forest Enterprises and forest management boards can contract forest land to communities, households and individuals. The contract term is usually fifty years. The contract conveys the rights to protect, manage and use the contracted area according to the contract terms and laws and regulations. The management and benefits from the contracted forest land depend on the classification of the forest and the state of the forest (bare land, planted, natural forest). The rights conveyed though a contract can be bequeathed within the household for the duration of the contract term. Because of the restricted management rights the case is fully out (membership score 0) of the combined set representing the ideal type.

Instead of the long term contracts, a large part of the contracted area has been contracted with short term contracts based on 5MHRP. Under this programme, contracted households are paid for protection and/or reforestation of the contracted area. Contracts under this programme cannot exceed five or six years (depending on forest category). The contracts are usually made for one year at a time. The contracts under the 5MHRP shorten the duration of rights to rather or very short term rights.

Community forestry in Vietnam (Case VIEcf)

Communities can be allocated forests that they are already using and forests that directly serve community interest and cannot be allocated to households and organisations. Communities can also be allocated protection and production forests within the communities' boundaries. Communities have the right to have the forest use right recognised by the state for stable and long term that corresponds with the forest assignment term (fifty years).

Communities need to draw management and development plans for the allocated areas and organise the implementation of the plans. Communities also need to draw forest protection and development rules. There are currently no formally established procedures for organising community forest management and drawing community forest management plans and rules. The implementation has been on a pilot project basis. However, forest legislation gives a central role to the community in drawing and implementing forest protection rules. Forest products can be used for community members' own needs, community development purposes, and for commercial purposes.

The current legislation gives quite detailed prescriptions for the management and development of forests and forest lands and for harvesting of forest products in different

forest categories. It is thus probable that communities will not have much freeway in drawing forest management plans and forest protection and development rules.

With a membership score of 0.33, this case is more out than in of the combined set that represents the ideal type. The low membership score results from rather restricted management rights.

Community participation in Kenya (Case KENcp)

In Kenya, a registered community association can apply for permission to participate in the conservation and management of state or local forests. It can then participate in the management of the forest according to a management agreement and management plan. The management agreement is valid for three years. It is drawn by the members of the community forest association, district forest officers and other stakeholders. The legislation enabling community participation is very recent in Kenya and still under development. Implementation has so far been on a pilot project basis.

The case of community participation in Kenya is fully out of the combined set that represents the ideal type (membership score 0). The membership in a community forest association is not inheritable, and thus the case is fully out of the set of transfer rights. The rights are based on a management agreement, which is made for three years, i.e. the rights are very short term rights. The case is also fully out of the set of secure rights because the legal framework does not address the issue of compensating community associations if the agreement is terminated or a particular use right withdrawn. It is also silent on compensating community rights on state land if the forest is exercised or its boundaries are altered.

Community participation in Mozambique (Case MOZcp)

In Mozambique, communities can in principle formalise land rights to the land that they have traditionally occupied and apply for formal title. However, the forest legislation grants communities only rights to subsistence use of forest resources even on titled community land. Commercial use is based on licences and forest concessions. Communities need to be consulted when commercial rights are allocated. Communities cannot veto against the allocation of licences or concessions. They can only negotiate with the licence/concession applicants regarding benefits in the form of e.g. employment or infrastructure development. Communities' exclusion rights are thus limited.

Because of the restricted management rights, this case is fully out of the combined set representing the ideal type. The membership score in the combined set is 0. Also, the use rights allow only subsistence use of forest products and exclusion rights are restricted.

The legal framework creates Local Resource Management Councils for co-managing forest and wildlife resources. Councils will be made up from representatives of local communities, private sector, associations and state authorities. Communities' participation in the decision making regarding the forest resources in their land areas is based on their representation in these councils. In practice, these councils either do not yet exist or do not function as intended.

There are no established procedures for community consultations, which aim at securing benefits to communities when timber concessions or licenses are granted. In practice, the process is weak and does not guarantee community benefits. Overall, the legal framework for developing and organising community participation and benefit sharing is incomplete. Regulations and guidelines for implementing the principles introduced in the FWL have not been drawn.

Village land forest reserves in Tanzania (Case TANvfr)

The case of village land forest reserves is the only case that is fully in the combined set that defines the ideal type (membership score 1). Villages have been devolved comprehensive use rights and extensive management and exclusion rights. These rights are secure, held perpetually and they are subject to membership in the village.

Villages can establish village forest reserves on village land and they can be gazetted. Villages are responsible for managing village forest reserves; they draw management plans and village by-laws. By-laws define the access to and use of forest resources in the reserve and the penalties for rule breaking as well as procedures for handling offences. The decision making regarding harvesting, licensing and the collection of fees and fines is devolved to the village. Management plan and by-laws have to be approved at the district level, but the district's role is to support villages in managing forest sustainably.

In practice, the distinction between village land forest reserves and village forest management areas has been unclear. Village forest management areas are managed jointly by the village and the state. Unclear distinction between these management models has restricted villages' potential rights to decide on the management and use of the forest. The emphasis has been on forest protection instead of developing sustainable forest-based activities and possibilities for income generation.

Village forest management areas in Tanzania (Case TANvma)

A village council can apply to manage a part of, or a whole, national or local authority forest reserve. The management is based on a joint forest management agreement between the village and state authorities. The agreement formalises the roles and responsibilities and the benefit sharing between the village and the state. Villages participate in the management planning and they need to develop village by-laws to enforce the agreement. There are no legally binding regulations regarding the distribution of responsibilities and benefits.

The membership score in the ideal type is 0.33, indicating that the case is more out than in of the combined set representing the ideal type. This is because of the restricted use and management rights and the short duration of the rights.

In theory, management agreements are made for five years and confer rather short term rights to villages. In practice, renewable one-year management agreements have been made. The implementation has thus reduced the duration of rights to very short term rights.

6 DISCUSSION

6.1 Devolved rights

The extent of *use rights* is important both for supporting local livelihoods and providing options for forest-based development through commercial use of forest products. Mostly only degraded forests, bare land and forest with low commercial potential have been transferred to community or household management. In the study countries, the devolution of use rights has concentrated on the fulfilment of local people's subsistence needs and allowed only restricted commercial use of forest products. In the majority of the cases, the right holder has either rights to subsistence use and restricted commercial use of forest products (five cases), or is entitled only to subsistence use (three cases). In only three cases, do the right holders have comprehensive use rights to both NTFPs and timber (LAOal, NEPcf, TANvfr). The rights regarding the use of NTFPs are generally more comprehensive than the use rights regarding timber. Restricted rights for commercial use reduce the income earning potential from forests. In practice, the use rights are often more restricted than the legal framework would allow. This has been the case for example in Nepal where the role of commercial utilisation of community forests is in practice still unclear, even though the community forest user groups are according to the forest law entitled to use forest products for commercial purposes.

Supporting subsistence use of forest products enhances local livelihoods. However, maintaining and supporting livelihoods based on subsistence use of forest products does not help local communities out of poverty. There are some examples, where the development of sustainable NTFP production and marketing has resulted in generating real income for local people and shown potential for poverty alleviation (see UNDP 2002 for honey production in Kenya, Morris et al. 2004 for NTFP development in Laos, Singh 2005a for lokta-based paper production in Nepal). In some exceptional cases, where communities have been able to develop commercial timber production, it has generated considerable employment and income for community members and for community development projects (see Auzel et al. 2001 for small-scale logging in Cameroon and Singh 2005b for community sawmill development in Nepal). Involving local people in forest product markets could offer large potential for income generation. This potential is currently not utilised (Scherr et al. 2003). The development of small and medium forest enterprises (SMFEs) could also offer promising opportunities for poverty reduction and sustainable forest management. The development of SMFEs and enhancing the possibilities to benefit from forest products markets require that the entrepreneurs have secure access to timber and/or NTFPs on which the production is based (Scherr et al. 2003, Donovan et al. 2006, Molnar et al. 2007). In the light of the results of this study, the devolved use rights do not fully support commercial utilisation of forest products or the development of SMFEs at the community level.

In addition to determining the subsistence use and income earning opportunities for the right holder, the comprehensiveness of use rights affects the economic efficiency of resource management (Pearse 1990). The right holder is naturally only interested in conserving and developing those forest products from which he or she is allowed to benefit. Timber exploitation can threaten the availability of NTFPs that are important to local communities. This can result in conflicts of interests between local communities and timber companies (Ndoye and Tieguhong 2004). On the other hand, when local communities are not entitled to benefit from timber they have little incentive to protect timber trees. When right holders do not have full rights to timber, they are sometimes entitled to a share of the revenues from timber harvesting (LAOvf and TANvma) or to a share from the concession and licence fees

(MOZcp). These arrangements should be carefully designed to make sure that the community share is large enough for providing long term incentives for sustainable forest management.

In Vietnam, households and communities have been paid for forest protection and regeneration work under the Five Million Hectare Reforestation Programme. The income received from the planting and protection contracts can be important to poor farmers. As long as they are paid for the planting, maintenance or protection work, the forest will be relatively safe from destruction. However, it has been argued that the cash incentives are too low. The determination of the payments is problematic. From the land holder's view point, the payment should compensate the costs of adopting a new land management system as well as the opportunity costs associated with it (Bui Dung The et al. 2004).

The results of this study are consistent with previous studies, which have concluded that despite the rhetoric, the devolution of forest *management rights* has been rather limited (e.g. Kellert et al. 2000, Shackleton et al. 2002, Sarin et al. 2003, Behera and Engel 2005, Hobley 2007). There is a clear tendency to devolve the rights to enforce rules and to monitor resource condition and use to the community level more extensively than the powers to decide on management and development of the resource. This gives the communities only a role as an "assistant to the state authorities" in controlling forest use rather than as a true manager and decision maker.

In the case studies, the management rights are mainly rather restricted (LAOal, LAOvf, VIEal, VIEcf, KENcp, TANvma) or restricted (VIEcon, MOZcp). This means that the right holder participates or has a limited role in the decision making regarding the harvesting and management of the resource. Only in two cases, are management rights extensive (NEPcf and TANvfr), and in one case rather extensive (NEPlf).

The role that user groups, communities and villages have in drawing management plans defines for the large part their role in the decision making regarding the use and management of forests. Generally, the formal frameworks for management planning emphasise local participation. In most cases, district forest offices have an important role in the management planning process. Because of the lack of capacity to develop management plans at the local level, the district authorities have an important role as facilitators and in guiding the management planning process even in cases, where management planning is formally devolved to community/village level.

Management plans are usually approved by the district forest authorities. This allows forest authorities to exercise strong control over the use and management of forest recourses even when communities are responsible for drawing the management plan. This authority has for example been used to prevent communities from utilising community forests for commercial purposes in Nepal (Springate-Baginski et al. 2002). Requirements for detailed inventories can also effectively prevent communities from exercising the rights that entitle them to use and manage forest resources. In Nepal, the handover of community forests and the renewal of operational plans are conditional to a detailed forest inventory. User groups have limited capacities and financial resources to conduct the required inventories, which has delayed the renewal of operational plans and slowed the process of handing over new community forests (Ojha et al 2003). Also in Tanzania, the requirements for a detailed forest inventory and management plan have effectively prevented villages from benefiting from the village forest reserve (Mustalahti 2007). The development of simpler forest management plans and inventory techniques are necessary for communities to be able to fully exercise the use and

management rights devolved to the local level. In addition extensive capacity building is needed to build local level capacity to actively participate in forest management. At the same time the role of forest authorities needs to be reoriented from policing to supporting local communities and households in sustainable forest management.

Detailed regulation can also effectively limit local decision making powers. In Vietnam, the legal framework consists of very detailed regulations on harvesting and management in different forest categories further limiting the ability of communities and households to make decisions concerning the harvesting and management of forest land. Also, the top-down implementation of forest allocation in Vietnam has impeded the transfer of authority over the decision making regarding forests. It has not really enabled the adaptation of forest management to local natural, socioeconomic and cultural conditions (Tran Duc Vien et al. 2005).

The degree to which management rights are devolved to the local level also affects the extent to which the use and management are adapted to local needs, knowledge and traditional resource management practices and natural conditions. The research that has concentrated on the conditions that contribute to the success of collective action in natural resource management has emphasised the role of arrangements through which those affected by the rules drawn for the use and management of resources can participate in designing and modifying these rules (Ostrom 1990). The focus on controlling forest use is not sufficient, if those living in or close to the forest are not involved in decision making regarding the rules (Ostrom and Nagendra 2006).

Exclusion rights determine the extent to which the right holder can exclude others from the resource. In most cases, exclusion rights have been devolved to the local level (LAOal, NEPcf, NEPlf, VIEal, VIEcon, VIEcf, TANvfr), allowing the right holder to exclude all others, including state sanctioned users, from the resource. In one case (TANvma), the village has an important role in the allocation of rights to outsiders. In two cases (LAOvf, KENcp), the right holder participates in the decision making regarding the allocation of rights to others. In one case (MOZcp), the right holder has only restricted exclusion rights. Communities cannot stop logging in the community area; they can only negotiate with logging companies for some benefits.

In practice, the exclusion rights may not be as strong as the legal framework would suggest. For example in Nepal, the leasehold groups have had difficulties in enforcing their rights to the leasehold area against others. Because of the eligibility criteria many community members, who have traditionally used the forest area, are not eligible for leasehold groups. Community members who have been excluded from the leasehold group have refused to respect the rights granted exclusively to the group. Leasehold groups have formed federations of leasehold groups to strengthen the capacity to enforce their rights. Federations have been more effective than small leasehold groups in excluding non-members.

The lack of or weak exclusion rights can have a profound negative effect on the right holders' motivation to protect and develop the resource. If the right holder cannot exclude others from using the resource, he or she has inadequate incentives to develop and protect it. On the contrary, it would be in his or her private interest to harvest the resource as soon as possible before others do.

Ultimately, the effectiveness of exclusion rights rests on the willingness and ability of the state to protect the devolved rights. In many cases, community rights have been overridden for the benefit of commercial or private interests. Contracts between communities and state organisations have been broken e.g. by allowing private operators to log in community managed forests (e.g. Hodgdon 2007). The strength of exclusion rights is also important for determining the community's powers in negotiating with the private sector, e.g. for a part of benefits when community land is used for tourism development or when logging concessions are awarded.

Control rights define the right holders' capacity to control who can access and benefit from the resource (exclusion) and to decide how the resource is managed and developed (management). Agrawal and Ostrom (2001) have compared decentralisation in four locations in India and Nepal. They concluded that effective decentralisation, i.e. positive changes in the vegetation and in the relationship between communities and the state, require that communities are allowed to decide on the management and use of the resources and can exclude others.

The case study analyses clearly show that, especially in relation to valuable forest resources, the devolution has not lead to meaningful changes regarding the control of forest resources. Valuable production forests are still quite generally under state control. Rights to forests have been devolved more extensively in areas with degraded forest or bare land. In most of the analysed cases, control rights are rather restricted (LAOal, LAOvf, VIEal, VIEcf, KENcp, TANvma) or restricted (VIEcon, MOZcp). Only in three cases out of eleven, has the control over forest resources been shifted to the local level actors (NEPcf, TANvfr with extensive control rights and NEPlf with rather extensive rights).

Governments have been reluctant to give up the control of and revenues from valuable forest resources. The revenues from timber harvesting are in many countries an important source of public revenue, although a large part of the potential revenues is lost due to illegal logging (WB 2006b). There has also been a general lack of trust in communities' ability of to manage forest resources sustainably. Forest and other government authorities have also been reluctant to give up the power over the use and benefits of forest resources. This power has been used in many countries to gain personal benefits through corruption or illegal forest harvesting (e.g. for Laos see Hodgdon 2006 and for Tanzania see Milledge et al. 2007). If devolution is to fulfil the expectations and realise the benefits related to bringing forest resources under local management, local actors should be granted the rights that enable them to effectively control and benefit from resources.

Local people should also be informed about their rights and the ways the rights can be actualised. It is quite common in the developing countries that local people are unaware of the rights they are entitled to or the ways to protect the rights. Awareness raising campaigns and capacity building are crucial issues also at the local level (Deininger 2003). In Mozambique, NGOs launched a campaign to disseminate the contents of the land law and to promote its application (Alden Wily and Mbaya 2001).

In the study countries the *duration of the devolved rights* ranged from very short term rights (less than three years) to perpetually held rights. In most cases, the rights were devolved for a rather long term or without time limit. In four cases, the rights are devolved without time limit (LAOal, NEPcf, MOZcp, TANvfr). Rather long term rights ranged from 40 to 70 years (NEPlf, VIEal, VIEcon, VIEcf). In three cases, the duration of rights was very short (KENcp)

or rather short (LAOvf and TANvma). The duration of rights defines the right holders' time horizon in relation to the conservation and management of forest resources. In order to create incentives for sustainable resource management and for investing in developing the resource, the right holder should be assured that he or she or descendants will be able to enjoy the benefits of his or her investment (Deininger 2003). It is doubtful that short term rights could provide long term incentives for investing in forest development.

In cases where rights are devolved for a specific time, the rights are usually renewable or can be extended. This process, however, is usually conditional to successful fulfilment of e.g. a previous management plan or other requirements. The renewal process can be expensive and cumbersome for local communities, and it offers an opportunity for forestry authorities to exercise power and control over the management of resources.

Property right systems should be secure, so that households and communities could be certain that their bundle of rights (use, management, exclusion and transfer rights) are respected by all others for as long as the rights specify. The source of rights, i.e. whether they are based on customary management systems or formal legislation, is important for the *security of rights*. Customary law can provide for secure rights within a community. However, if customary rights are not formally recognised, they lack the authority system that would make others respect the rights. Only when rights are protected by the state through formal recognition can they be held against outside claims and against the state. In five cases, the legal framework enables, in principle, the right holder to acquire a formal title or certificate as an indication of state recognition of rights (LAOal, VIEal, VIEcf, MOZcp, TANvfr). In another five cases, the rights are based on formal contracts (LAOvf, NEPlf, VIEcon, KENcp, TANvma). In Nepal, community forests are handed over to user groups according to the forest law (NEPcf).

The rights holder should also be entitled to a just compensation, if their rights are taken away or restricted. In general, the legal frameworks in the study countries entitle the right holder to compensation if the rights are fully or partly withdrawn. The situation is unclear only in one case (KENcp). In practice, the rights to compensation are probably much weaker than the legal frameworks imply. For example, in relation to infrastructure development projects and to relocations in upland areas, evicted or relocated families have claimed to having been insufficiently compensated or even been forced to move without any compensations (see Countries at the Crossroads 2005 for Laos, UNHCR 2007 for Vietnam).

For secure rights, the land area to which the rights apply needs to be clearly defined. The definition of borders is addressed in the legal frameworks of all cases. Even though there is no difference between the cases in respect to this attribute it was included in the analysis because of its theoretical importance. The process for defining borders is an important element in the process of establishing local level forest management. Quite generally, the traditional borders between communities/villages have been the starting point for defining the borders.

It is also important that the right holder is clearly defined. In nine cases, the right holder is clearly defined and has a legal status. In one case, the right holder is clearly defined but not recognised as a legal entity (VIEcf). The Nepalese legislation does not include provisions for forming and registering leasehold groups (NEPlf); this undermines the security of the rights granted through the leasehold agreement. The lack of legal status prevents the right holder e.g. from entering into agreements and opening a bank account.

The security of rights can be undermined by inconsistencies in the legal framework Evidence from Laos shows how government authorities have prevented villagers from exercising their legal rights by referring to the constitution and forest law, which state that all land is owned by the state and that the state holds the highest authority regarding land and forest management (Hodgdon 2007). When the rights are subject to an approval from authorities, communities can be denied to participate in forest management. Contradictions or discrepancies between the legal documents that enable devolution of forest-related rights and the higher level laws can be used to block local right holders from exercising their rights.

The overall security of the rights and right holder's ability to defend the rights to forest land and resources depend also on the general development of the legal system and the strength of the "rule of law". Undeveloped court system and corruption can severely undermine the security of local rights. If forest authorities do not respect the law and a properly working court system does not exist, local communities do not have options for defending their legal rights.

The global Forest Law Enforcement and Governance and Trade initiative (FLEGT) tries to curb illegal forest exploitation and associated trade, and enforce the rule of law. In this context, it would be important to analyse how the legal framework protects the rights of local communities. Enforcing laws which do not support local people's traditional rights or participatory forest management systems will further weaken local communities' claims to forest resources. There is also a risk that law enforcement focuses on people living in or near forests instead of on the more powerful actors involved in illegal logging and trade (Wells et al. 2006).

The fuzzy memberships were scored according to the possibilities created by the legal framework in each country. In practice, these possibilities have not fully been realised, and the implementation of devolution policies has often led to an outcome that does not fully put into practice the possibilities created by the legal framework. The implementation has in many cases led to situations where the devolved rights are clearly more limited than the law would allow. Because of this, the fuzzy membership scores for each case study can actually in reality deviate even more from the ideal type than the analyses show. The analyses thus present the most optimal situation created by the formal framework. Also, in most study countries, the legal framework that allows local participation in forest management is quite recent and under development. From the study countries the legislation that enables community forestry has been in effect for more than two decades only in Nepal. In the early phases of developing devolution policies, the implementation has often varied between programmes and pilot projects as slightly different models have been tested.

6.2 Empirical typology of the cases

Quite generally the discussion and information regarding forest ownership evolves around the categories of public ownership, private ownership and other owners (e.g. FAO statistics). This categorisation does not provide enough information on the devolution of rights regarding forests and different forms of participatory forest management, because in most cases the forest lands still remain officially under state ownership. Devolution of forest-related rights has an important role in the forest policies of many developing countries. Claims regarding devolution have been made without defining what rights are actually transferred to the local level within the legal framework. In order to analyse the main types of devolution presented

in the case studies, the fs/QCA programme was used to develop an empirical typology of the cases based on each case's fuzzy membership scores. The resulting typology differentiated between five types. In Figure 4 the cases belonging to the different types are grouped according to the security and duration of rights. Cases circled with a strong continuous line have extensive control rights, and cases circled with a dotted line have extensive use rights.

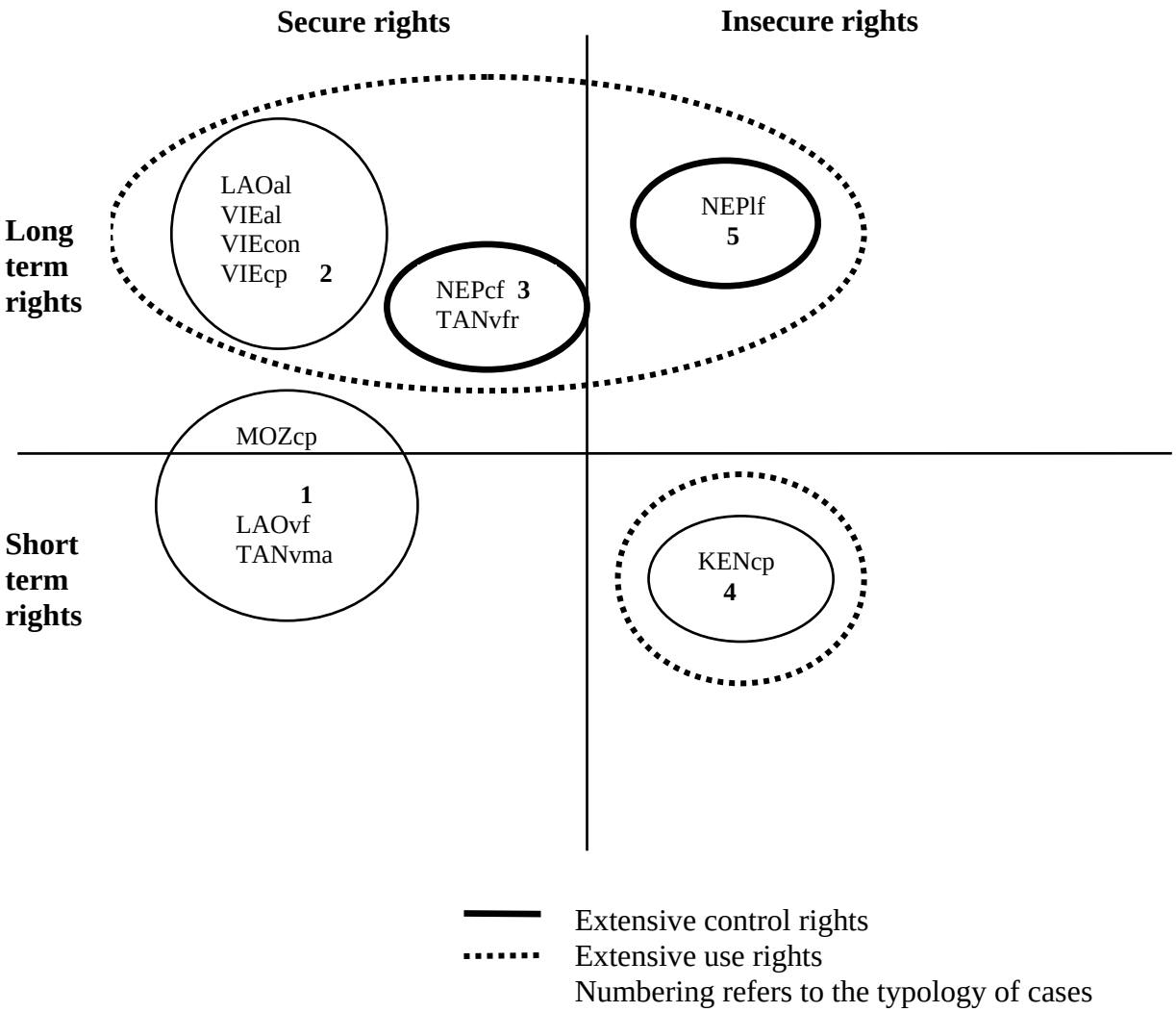


Figure 4. Empirical typology of the cases.

The first type (1) was defined by *restricted use and control rights*. The rights were secure and can be bequeathed. It covered village forestry in Laos (LAOvf), village forest management areas in Tanzania (TANvma) and community participation in Mozambique (MOZcp). The second type (2) was defined by *extensive use rights but restricted control rights.* The rights were also secure. This type covered land allocation to households in Laos (LAOal) and Vietnam (VIEal) as well as contracting forest land to households (VIEcon) and community forestry (VIEcf) in Vietnam. The third type (3) covered community forestry in Nepal (NEPcf) and village forest reserves in Tanzania (TANvfr). This type was defined by *extensive rights*. The rights were secure and can be bequeathed. The fourth (4) type covered only one case community participation in Kenya (KENcp). It was defined by *insecure, short term use and restricted control rights*. The fifth (5) type was defined by *insecure extensive rights*; it also covered only one case the leasehold forestry in Nepal (NEPlf).

Alden Wily and Mbaya (2001) distinguish two main approaches in the devolution in the forestry sector: benefit sharing and power sharing approaches. The main criterion for this division is the degree to which management authority has been devolved to the local level. In the benefit sharing approach, local cooperation e.g. in forest protection and rehabilitation is gained through granting communities legal rights to harvest certain forest products, graze in the forest, or through offering employment opportunities, or a share of timber revenues. Management authority rests for the most part with the state. The power sharing approach includes a real transfer of management authority to the local level. Compared with the grouping of the cases in this study, the groups 1, 2 and 4 clearly belong to the benefit sharing approach. Groups 3 and 5 represent power sharing arrangements, which include the transfer of management authority over forest resources.

The devolution of rights to the local level enables in principle households and communities to benefit from forest resources. However, quite often it has also led to restrictions regarding the collection or harvesting of forest products. At the same time, devolution has led to the transfer of forest protection and management responsibilities to the local level. In the study countries, the forest legislation quite commonly confers right holders the general responsibility to protect and develop the forest. In cases where rights are devolved to communities or villages the community needs to organise itself, develop forest use and protection rules, draw a management plan or participate in the management planning, and organise the implementation of the plan, or participate in the implementation. Protection and patrolling the forest are usually devolved to the local level. Communities also need to report to forest authorities on the condition and development of the forests. In order to create incentives for overtaking forest management responsibilities and investing time and resources in forest management and protection activities, the benefits received should exceed the costs for those who are involved (Ostrom 1990).

There is a clear connection between the typology and the extent of benefits the right holder is entitled to. In cases within the first type, benefits are limited and mainly based on the rights to use forest products for subsistence use. In this type villages and communities are entitled to a share of timber revenues and other benefits e.g. through employment. Within the cases in the second type, the right holders are entitled to the results of their own labour and investments. In Vietnam, however, benefit sharing arrangements are complicated. Benefits depend on forest classification and state of the forest at the time of allocation, as well as on who has invested in forest development. In the third type, communities and villages are entitled to all

benefits. In Kenya, which represents type four, the forest law states that community forest associations can be entitled to forest products for everyday use, plantation establishment and other benefits as agreed. They can also be entitled to develop wood and non-wood forest products based industries. The fifth group covers only leasehold forestry in Nepal. Leasehold group is entitled to the products from the leasehold area, except the trees that exist on the area at the time of leasing. These trees belong to the state. The main benefits and responsibilities devolved to the local level in each case study are compiled in Appendix 3.

When devolution is implemented in degraded areas where the use of forest products is restricted, or when the rights do not include rights to timber, it can be difficult to provide right holders with sufficient benefits to interest them in investing in forest protection and development. Experiences from Tanzania show that the restricted opportunities for tangible benefits or income can seriously constrain communities' interests in joint forest management (Meshack and Raben 2007). Direct government payments for forest protection and payments for environmental services (PES) have been suggested as means to make protection and rehabilitation viable options for communities. Under the 5MHRP in Vietnam, the state has funded short term contracts to protect or regenerate forests. However, it has been argued that short term payments for protecting forest do not provide sustainable long term incentives. They encourage households to protect forests for government payments, not for the current or future benefits that forests provide. Farmers would probably end protection when the payments end (Nguyen Van Thinh et al. 2000, Bui Dung The et al. 2004). These payments are a way of compensating for the labour invested in protection and planting rather than PES (Wunder et al. 2005). The governments in developing countries can not afford to pay for the protection of all forest areas designated for protection or rehabilitation.

The development of payment mechanisms for environmental services has potential to enhance local development and sustainable forest management. The realisation of this potential requires the establishment of strong, clear and secure property rights (Landell-Mills and Porras 2002, Katila and Puustjärvi 2003). Many carbon funds are already in operation. Mechanisms for the compensation for "reduced emissions from deforestation and degradation" (REDD) are being developed, and pilot implementation is planned to start in 2008 (Carbon Finance Unit 2007). REDD payments can bring important benefits to local communities. These benefits depend on how the national governments decide to distribute the payments at a lower level. However, without due regard to local rights, these mechanisms can also lead to increasing state control over forests. Most of the forests in developing countries are still officially under public ownership. The payment schemes and benefit sharing arrangements will probably be partly determined by property rights. Unless the state recognises customary and other local rights to forests, local people may not benefit, instead their rights can be overridden by establishing protected forest areas for receiving REDD payments (Griffiths 2007).

Currently the forest-related legal frameworks in the study countries do not explicitly address PES. The development of schemes for PES also creates new attributes to property rights. When a new aspect of a resource becomes valuable, a right system will need to be established to define who is entitled to benefit from it and how (Swallow et al. 2005).

6.3 Case studies' conformity to the ideal type

Property rights consist of a bundle of rights. The incentives for sustainable forest management and opportunities for forest-based local level development are shaped by the combined effect of the rights and their duration and security. To assess the overall extent to which the combined attributes of rights have been devolved to the local level the cases were compared against an ideal type. The ideal type was defined on the basis of the theoretical discussion as a situation where the rights holder has been devolved secure, comprehensive use rights, extensive management, exclusion and transfer rights, and the rights are held perpetually. The ideal case was defined for analytical purposes to structure the analysis. The ideal type analysis enabled the analysis of the cases as wholes against common criteria, and it enabled the identification of the weakest rights in the bundles of rights that were devolved to the right holders in each case. The ideal type analysis can thus be used to indicate what attributes of rights should be strengthened to obtain the situation described by the ideal case.

Overall, the case studies' membership scores in the ideal type were very low. Only two cases (community forestry in Nepal and village forest reserves in Tanzania) had high membership scores in the ideal type. All other cases' membership scores were low or they were fully out of the ideal type. The reasons behind the low combined membership scores indicate which attributes of the rights were weakest in each case. The clearly most common reason for the low conformity to the ideal type was restricted management rights. The short term of the rights, restricted transfer rights or restricted use rights were the reason or one of the reasons for low conformity to the ideal case in three cases, restricted exclusion rights in two cases and insecure rights in one case.

The allocation of forest land in Laos and Vietnam and community forestry in Vietnam received low memberships in the ideal case because of restricted management rights. In these cases, allowing the right holder more decision making authority regarding the use and management of the allocated forest land would bring them closer to the ideal type. Also, village forestry in Laos and village forest management areas in Tanzania had low membership scores in the ideal type. The reasons for this were the short term, restricted use and management rights. In village forestry in Laos, the exclusion rights were also restricted. For these cases, lengthening the term of the management agreement and allowing for commercial use of timber as well as more authority in the management decisions would shift them closer to the ideal type. In Lao village forestry, villagers' rights to participate in the logging decisions concerning their village area should also be strengthened.

Leasehold forestry in Nepal, contracting forestland in Vietnam and community participation in Kenya and Mozambique were all fully out of the ideal type. In leasehold forestry, the reason was the lack of transfer rights; the rights were also rather insecure. Currently the status of rights of the individual leasehold group members is not clear. To provide incentives for long term sustainable resource management, the rights of individual members should be inheritable. In addition, the eligibility criteria for group membership should be clearly stated and the procedures for establishing and registering leasehold groups should be stated in the law. In contracting forest land in Vietnam, the lack of management rights and restricted transfer rights led to low overall membership score in the ideal case. More extensive transfer and management rights would bring this case closer to the ideal type.

Community participation in Kenya was fully out of the ideal type because of the short duration of the rights, restricted management rights and the lack of transfer rights and

security. To strengthen the rights the term of the management agreement should be lengthened and the membership in the community forest association should be made inheritable. The rights should be made more secure by entitling the association to compensation, if the rights are withdrawn for other reasons than that of the association breaking the contract. Compensation should cover the investments made in protecting and developing the forest.

Community participation in Mozambique was also fully out of the ideal type. The reasons for this were the lack of management and exclusion rights and restricted use rights. Communities can obtain a title for community land, but they cannot prevent logging by commercial operators in this land. Overall, the communities have a limited role in the decision making regarding the management of forest resources on community land. The communities' rights to participate in the decision making regarding the management of forest resources and the allocation of logging rights on community lands should be strengthened. Communities should also be entitled to use timber for commercial purposes.

6.4 Right holders

The definition of the right holder to whom forest-related rights can be devolved varies between the study countries. The right holders can be grouped into households, community-based or other corporate organisations, and communities and villages represented by village administrative authorities.

In Laos and Vietnam, rights to degraded forest and forest land have been allocated (Laos, Vietnam) and contracted (Vietnam) to individuals and households. The rights have thus been privatised to a certain extent. This is in line with the neoclassical economic theory that emphasises the role of individualised property rights in the long term resource conservation and in increasing investment. However, the experiences from forest land allocation in Laos and Vietnam have shown that the effects of forest land allocation are location specific and vary according to the household characteristics (amount of land, labour) geographical location (access to markets) and natural conditions, which largely determine the production options for farmers. The livelihood effects have been closely connected to the amount of land the households have for food production. Only better off households have afforded to invest in tree planting. In Laos and Vietnam, one of the objectives of land allocation in upland areas has been to reduce the amount of land used for shifting cultivation. However, in the upland areas the options for permanent cultivation are limited. Due to decline in the soil fertility in these areas, the forest land allocation and limitation on the amount of land that can be used for shifting cultivation have lead to diminishing crops (Hanoi Agricultural University 2001, Castella et al. 2002, Morris et al. 2004, Rock 2004). In some countries, favourable market conditions and the declining availability of forest products from natural forests have increased tree planting on private agricultural lands (Bertomeu 2006, Carsan 2007).

The above discussion clearly emphasises the importance of the careful assessment of the role of forest resources in the livelihood systems and the production options available for the local people when considering the options for and the production possibilities created by privatising rights to forest land. Forest land and trees should be seen as important components of the diversified production systems, which form the basis for most of the smallholder agriculture.

Privatising the rights to forest and forest land will exclude the majority of the population from forest resources. To provide for the continuous access to forest resources for subsistence needs has been one of the guiding principles in the devolution policies of the study countries. Traditional communities have often formed the principal unit to which the rights are devolved. In Vietnam, forest land can be allocated to communities and held under common ownership by the community (in Vietnam ownership refers to the issuance of the land use certificate). The forest and land laws define the community, which is eligible for forest land allocation. Community forestry is in Vietnam targeted especially at ethnic minority communities. In Mozambique, the community can formalise customary rights to land and obtain a joint title. This process is based on a delimitation process that includes an agreement on the territorial limits of the community with neighbouring communities.

In community forestry in Nepal, the rights are devolved to a user group, which consists of the actual forest users. All households in the community are eligible for membership. In the leasehold programme in Nepal, on the other hand, the rights are granted to a small group consisting of the poorest members of the community. The membership in a leasehold group has been conditioned by a maximum amount of cultivable land and annual income. This has led to situations where people, who have traditionally used the land, are not eligible for membership in the leasehold group. The exclusion of some community members from using the leasehold area has caused severe conflicts; non-members have refused to respect the rights granted exclusively to a small group (Nagendra et al. 2005).

In Kenya, the rights are devolved to a community forest association, which is defined in the law. In addition to community-based groups willing to participate in forest protection and management, the definition includes groups of people who have registered an association or organisation that is engaged in forest conservation. The definition leaves room for others than the local forest users to become involved in forest management. In this respect this case is clearly different than the other cases where the rights are devolved only to the local forest users.

In Laos and Tanzania, the rights are devolved to the village level. In these countries a village is an administrative unit and village authorities have rights and duties described in the legislation. In most cases, traditional borders between villages are used as the basis for defining and formalising village land areas.

Forest resources have an important role in the livelihoods of the rural people in developing countries. This accentuates the importance of inclusive resource management regimes that can provide continuous access to forests products to people that have traditionally used them and continue to depend on these resources.

Each case study represented a modality based on a single institutional form, like community forestry, leasehold forestry or household forestry. However, under these overall tenure forms, the use and management of forest resources can be differentiated, and combined arrangements can be developed. Differentiated arrangements could also be designed to enable the incorporation of traditional forest management practices into the formal management regimes (Sikor and Tran Ngoc Thanh 2007).

In some traditional land tenure systems communal tenure has been successfully combined with private rights (see Mendes 1988 for an agro-pastoralists' tenure system in Morocco). Under community forestry in Nepal, new arrangements have been developed to better adjust

community forestry to local conditions. These arrangements combine private and common property regimes. Valuable timber is under collective management, but small plots of degraded or bare land are allocated to households for agroforestry production (Acharya 2005). These kinds of combined arrangements can better accommodate the needs of the poorest community members, women or other marginalised groups. Legislation should be flexible enough to enable these arrangements and the different production opportunities that they could support. Regulations, which e.g. prohibit the cultivation of annual crops on forest land, can limit the potential these arrangements could offer (LFP 2004).

6.5 Evaluation of the study

Fuzzy set theory, the development of an empirical typology of cases and the ideal type analysis were found to provide an appropriate method for conducting comparative case study analysis in a systematic way. The methods enabled the measurement of qualitative attributes against predetermined common criteria. They also provided a method to analyse the cases as wholes that consist of different attributes. Fuzzy sets provided a way to operationalise theoretical concepts. The fuzzy sets and their scoring had to be developed to represent the theoretical concepts that guided the analysis. At the same, time fuzzy sets had to be meaningful in the light of the empirical evidence. During the analysis the fuzzy sets and their scoring had to be adjusted to better reflect the reality represented in the case studies.

The nature of the case study evidence influenced the construction of the fuzzy sets. Because of fully qualitative data, the use of fine graded sets was not possible. In addition, because the fuzzy set analyses were in this study used for developing an empirical typology of the cases, the breaking point score of 0.5 could not be used. Also, with more fine graded sets the diversity between the cases would have been likely to increase. This would have made the development of a meaningful typology difficult, because the minimisation of the truth table with a small number of cases and a relatively high number of attributes would probably not have provided a meaningful solution for a typology. Even with the eleven cases and six attributes of rights analysed in this study, the minimisation procedures did not at first provide a meaningful typology. Because of the large diversity between the cases, the truth table could not be minimised to provide a solution without overlapping and a high number of solution terms. In order to reduce the diversity, two original attributes were combined to form a new attribute. With eleven cases and five attributes the minimised solution still included some overlapping between the solution terms but provided a meaningful basis for the empirical typology. A meaningful analysis of very diverse cases seems to call for either a rather limited number of attributes or a large number of cases.

The greatest advantages of the method related to the way it required the researcher to carefully consider the theoretical concepts, their operationalisation and scoring of the cases. In addition, it enabled systematic analysis and comparison of qualitative case study information. The ideal type concept provided useful common criteria against which to measure the cases. It was used as a measuring stick, which guided the construction of the fuzzy sets and the scoring of the cases.

For establishing the quality of a non-causal social research three tests are relevant: construct validity, external validity and reliability (Yin 1994). *Construct validity* refers to establishing correct operational measures to the concepts that are being studied. In this study, the definition of the key attributes of rights was based on the theoretical framework. The

operationalisation of the concepts and their calibration were based on theory and case study evidence. The case study evidence was for a large part based on the legislation of each study country. During the analysis of the case study evidence, the original ideas regarding the operationalisation and calibration of the fuzzy sets were adjusted to better fit the evidence and provide a meaningful calibration.

External validity refers to the generalisation of the study findings. In case study research, generalisation refers to analytical generalisation instead of statistical generalisation, which is possible in survey research. In analytical generalisation, the results are generalised to theoretical ideas. In this study, eleven case studies were analysed using the same protocol for collecting, presenting and analysing the evidence. The cases present the main different ways in which forest-related rights have been devolved to the local level in six developing countries. The results showed that the devolution has been implemented in very different ways and the content and extent of the devolved rights vary greatly, and emphasised the importance of paying attention to all aspects of property rights and carefully analysing what rights are actually devolved under the general labels of decentralisation and devolution.

The fuzzy set analysis and the empirical typology developed in the study were specific to the cases included in the analysis. Other cases, with different membership scores in the fuzzy sets, could result in a slightly different typology. However, the typology describes the main types of devolution in the study countries and gives some indication of the differences in the approaches of devolving rights. The study would have benefited from a larger number of case studies. Especially, the development of the typology would have profited from the inclusion of cases from other parts of the world, especially from West Africa and South and Central America. This would have increased the geographical coverage of the study. An analysis of a large number of cases from different parts of the world is needed for making broader generalisations regarding the devolution of forest-related rights.

The procedures in the study, including the selection of the important attributes of rights, the operationalisation of these attributes through fuzzy sets and transferring case study evidence to fuzzy membership scores, are carefully documented to ensure the *reliability* of the study.

The legal frameworks that enable and guide the devolution of forest-related rights within the study countries vary greatly. Because of this the case study evidence was not fully systematic or strictly comparable. The legal frameworks contain some inconsistencies and are in some cases under development or review. The rights are not always clearly defined or some aspects of the rights are not addressed at all. In some study countries, the legal framework is very detailed and complemented with regulations and guidelines, while in others the framework is mainly based on one general law and the regulations or guidelines for implementation are still lacking. The variation within the legal frameworks and in their implementation is reflected in the case study descriptions. Because of the variation in the coverage and detail of the evidence, very detailed analyses were not possible. Also, as discussed above the development of a meaningful empirical typology would have been difficult with a large number of fuzzy sets.

6.6 Conclusions and recommendations

The devolution of forest-related rights to the local level has an increasingly central role in the forest policies of many developing countries. The nature and extent of the devolved rights shape the forest-based subsistence use and income earning options for local communities and define the incentives for sustainable use and management of forest resources. If devolution is to realise its potential for poverty reduction and sustainable resource management, the devolved rights should provide adequate incentives and options for sustainable management and income generation.

The study shows that the devolution has been implemented in very different ways and the content and extent of the devolved rights vary greatly. The theoretical considerations emphasise the importance of paying attention to all attributes of rights. A narrow focus on some aspects of property rights, without considering the overall combined effects of the different attributes of rights, is unlikely to lead to livelihood improvements or sustainable forest management. When rights are devolved to the local level, the focus should thus be on the bundle of rights that is being devolved, and the duration and security of the rights. In general, despite the rhetoric in national forest and devolution policies, the transfer of rights to the local level has not really altered the powers of the state in controlling forest resources, especially valuable timber. The devolution policies have enabled the transfer of only rather restricted rights to decide on the use and management of forest resources to the local level.

For improving devolution policies the following recommendations are made on the basis of this study:

- The legal framework, which defines the options and possibilities for devolution of forest-related rights, should address the whole bundle of rights as well as the duration and security of the rights.
- The devolution of rights to decide on the use and management of forest resources should be strengthened.
- Rights should be devolved for a long time period, which would correspond with the long term nature of wood production.
- In countries where the legal frameworks are still incomplete, the regulations and guidelines needed for implementing devolution policies should be drawn.
- Detailed regulations and complicated procedures for exercising devolved rights should be avoided.
- The implementation of devolution policies should take full advantage of the possibilities created by the legal framework.
- The policy and legal frameworks should be carefully analysed to find possible contradictions and discrepancies and developed to form a secure foundation for local level resource management.

While the devolution of rights is necessary for creating the possibilities for positive outcomes, it does not guarantee sustainable or equitable resource management. The nature of the recipient of the devolved rights is equally important. The strength, representation, legitimacy and accountability of the community/village organisations to which resource management powers are devolved also greatly affect resource use and management. The social, political and economic conditions at the local level and especially the distribution of power within communities, and the relationships between local elites and authorities also affect the local level outcomes of devolution. The development of democratic participatory processes, capacity building and social learning at the local level are necessary for enhancing equitable

and sustainable local level resource management. One of the most important issues in devolving rights to the local level is the governments' long term commitment to support devolution policies and the development of more democratic governance of forests at local, regional and national levels. In less democratic countries this may take place only as part of overall democratisation and power sharing.

This study analysed the devolution of forest-related rights in six countries in Southeast Asia and Africa. Research in other regions and countries is needed to provide information on the extent to which rights and responsibilities have been devolved. Secure tenure arrangements can be provided through different tenure systems. The arrangements should be adapted to natural, social and cultural conditions. Leases or contracts, which devolve long term, secure rights can provide the incentives needed for sustainable management. Future research should focus on the different ways of devolving rights to the local level (privatisation, leasing, management agreements) and their effects on local development, poverty and resource management, including sustainability and productivity. The options for developing innovative tenure systems, which enable the combination of different management regimes, should also be investigated.

The development of democratic local level resource management requires the development of new organisations or the adjustment of traditional organisations to take over management responsibilities and represent local interests. More information is needed for developing different organisational forms and ways to put devolution policies into practice in different socioeconomic and cultural settings.

This study focused on the legal frameworks that enable devolution in the study countries. However, the case studies clearly indicate that there is a large gap between the formal frameworks and the practical implementation of devolution policies. These differences should receive more attention, and the reasons for the differences between the legal framework and its implementation should be further analysed to clarify what the devolution has actually meant on the ground. This is important also for assessing the impacts of the devolution policies. The impacts should be analysed in relation to the actually devolved rights, and not only in relation to the general intent and opportunities expressed in policies and legal frameworks. In addition, the implementation has varied even within countries. Local level studies are needed to analyse the contents and security of devolved property rights, as well as their impacts on local livelihoods and sustainable forest management.

REFERENCES

Acharya, K.P. 2002. Twenty-four years of community forestry in Nepal. International Forestry Review 4(2): 149-156.

Acharya, K.P. 2005. Private, Collective, and Centralized Institutional Arrangements for Managing Forest "Commons" in Nepal. Mountain Research and Development 25(3): 269-277.

Adhikari, B. 2005. Poverty, property rights and collective action: understanding the distributive effects of common property resource management. Environment and Development Economics 10: 7-31.

Adhikari, B., Di Falco, S. & Lovett, J.C. 2004. Household characteristics and forest dependency: evidence from common property forest management in Nepal. Ecological Economics 48(2): 245-257.

Agrawal, A. 2000. Group Size and Successful Collective Action: A Case Study of Forest Management Institutions in the Indian Himalayas. In: Gibson, C.C., McKean, M.A. and Ostrom, E. (eds.). People and Forest. Communities, Institutions, and Governance. The MIT Press Cambridge, Massachusetts. Pp. 57-86.

Agrawal, A. & Gibson, C. 1999. Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. World Development 27(4): 629-649.

Agrawal, A. & Ribot, J. 1999. Accountability in Decentralization: A Framework with South Asian and West African Cases. The Journal of Developing Areas 33: 473-502.

Agrawal, A. & Ostrom, E. 2001. Collective Action, Property Rights, and Decentralization in resource Use in India and Nepal. Politics & Society 29(4): 485-514.

Alden Wily, L. 2001. Reconstructing the African Commons. Africa Today 48(1): 77-99.

Alden Wily, L. 2002. Participatory forest management in Africa. An overview of progress and issues. CBNRM Net, The Community-Based Natural Resources Management Network [Internet site]. Available at: http://www.cbnrm.net/pdf/aldenwily_l_002_cfm.pdf. [Cited 8 May 2006].

Alden Wily, L. & Dewees, P. 2001. From Users to Custodians. Changing Relations between People and the State in Forest Management in Tanzania. Policy Research Working Paper 2569. The World Bank, Environment and Social Development Unit. 31 p.

Alden Wily, L. & Mbaya, S. 2001. Land, People and Forests in Eastern and Southern Africa at the Beginning of the 21st Century. The impact of land relations on the role of communities in forest future. IUCN Eastern Africa Programme. Forest and Social Perspectives in Conservation. IUCN EARO, Nairobi. 298 p. + Annexes.

Amatya, S.M. 2002. A Review of Forest Policy in Nepal. In: Enters, D. and Leslie, R.N (eds.). Information and Analysis for Sustainable Forest Management: Linking National and International Efforts in South and Southeast Asia. Workshop Proceeding 2. Proceedings of the

Forest Policy Workshop, Kuala Lumpur, Malaysia 22-24 January, 2002. FAO, Bangkok, Thailand. Pp. 79-83.

Apel, U. & Pham Van Vien 1998. The Community Forest Management Strategy of the SFDP Song Da. Vietnamese - German Technical Co-operation, Social Forestry Development Project (SFDP) Song Da, Ministry of Agriculture and Rural Development - GTZ -GFA. Community Forestry Unit, Working Paper No. 9. Revised Version 11/98. 24 p.

Arabuko-Sokoke Forest Management Team 2002. Arabuko-Sokoke Strategic Forest Management Plan 2002-2027.

Arnold, J.E.M. 1998. Managing forests as common property. Community Forestry Paper 136. FAO, Rome, Italy. 67 p.

Artemiev, I. 2003. State Forest Enterprise Reform in Vietnam. Unlocking the Potential for Commercial Wood Growing. WB EASRD Technical Note. 21 p.

Ashley, C. & Wolmer, W. 2003. Transforming or Tinkering? New Forms of Engagement between Communities and the Private Sector in Tourism and Forestry in Southern Africa. Sustainable Livelihoods in Southern Africa, Research Paper 18. 67 p.

Azuel, Ph., Nguenang, G.M., Feteké, R. & Delvingt, W. 2001. Small-Scale Logging in Community Forest in Cameroon: Towards Ecologically More Sustainable and Socially More Acceptable Compromises. RDFN paper 25f(i). RDFN, ODI London UK. 12p.

Baland, J.-M. & Platteau, J.-P. 1996. Halting degradation of natural resources. Is there a role for Rural Communities? FAO, Rome.

Baland, J.-M. & Platteau, J.-P. 1999. The Ambiguous Impact of Inequality on Local Resource Management. World Development 27(5): 773-788.

Balbase, N. 2000. Forest law and regulations, obstacles for improvement. Internal report. Needs for research to support forestry law and regulations. DFID project Number (R No.): R7339. 35 p.

Bampton, J. & Cammaert, B. 2006. How can timber rents better contribute to poverty reduction through Community Forestry in the Terai region in Nepal. Paper presented at International Conference on Managing Forests for Poverty Reduction: Capturing Opportunities in Forest Harvesting and Wood Processing for the Benefit of the Poor. Ho Chi Minh City, Vietnam, October 2006. 19 p.

Bao Huy 2006. Technical Guidelines - Community Forest Management. ETSP – Extension and Training Support Project for Forestry and Agriculture in the Uplands, Helvetas, Vietnam. Hanoi. 70 p.

Barrow, E., Clarke, J., Grundy, I. Jones, K-R. & Tessema, Y. 2002. Analysis of Stakeholder Power and Responsibilities in Community Involvement in Forestry Management in Eastern and Southern Africa. IUCN Eastern Africa Regional Office, Nairobi, Kenya. 154 p.

Barzel, Y. 1997. Economic analysis of property rights. Cambridge University Press, New York, USA. 161 p.

Behera, B. & Engel, S. 2006. Institutional analysis of evolution of joint forest management in India: A new institutional economics approach. Forest Policy and Economics 8(4): 350-362.

Belcher, B., Michon, G., Angelsen, A., Ruiz-Perez, M. & Asbjørnsen, H. 2000. Cultivating (in) Tropical Forests? The Evolution and Sustainability of Systems of Management between Extractivism and Plantations. In: Asbjornsen, H., Angelsen, A., Belcher, B., Michon, G., Ruiz-Peres, M. and Wijesekara, V.P.R. (eds.). Proceedings of the Workshop: Cultivating (in) Tropical Forests? The evolution and sustainability of systems of management between extractivism and plantations. 28. June – 1. July 2000, Kræmmervika, Lofoten, Norway. ETFRN Publication Series. Pp. 9-18.

Bertomeu, M. 2006. Financial evaluation of smallholder timber-based agroforestry systems in Claveria, Northern Mindanao, the Philippines. Small-scale forestry 5(1): 57-81.

Biggs, S.D., Gurung, S.M. & Messerschmidt, D. 2004. An Exploratory Study of Gender, Social Inclusion and Empowerment through Development Groups and Group-Based Organizations in Nepal: Building on the Positive. Report Submitted to the Gender and Social Exclusion Assessment (GSEA) Study National Planning Commission, The World Bank and DFID. Version 2. Kathmandu, November 2004. 154 p.

Bila, A. 2005. Estratégia para a Fiscalização Participativa de Florestas. Support for the implementation of forest and wildlife legislation in Mozambique, DNFFB/FAO. TCP/MOZ/2904 (A), Maputo, Janeiro 2005. 42 p.

Blomley, T. & Ramadhani, H. 2004. Going to Scale with Participatory Forest Management: Early lessons from Tanzania. Tanzania Natural Resource Forum, Occasional Paper No. 4. 11 p.

Blomley, T. & Ramadhani, H. 2007. Participatory Forest Management in Tanzania - an overview of status, progress and challenges ahead. Tanzania Forest Conservation Group, The Arc Journal, Issue No. 21, September 2007. Pp. 3-5.

Bromley, D.W. 1991. Environment and Economy. Property Rights and Public Policy. Basil Blackwell, Oxford, U.K. 247 p.

Brown, D., Malla, Y., Schreckenberg, K. & Springate-Baginski, O. 2002. From supervising 'subjects' to supporting 'citizens': recent developments in community forestry in Asia and Africa. ODI, Natural Resource Perspectives Number 75(February). Overseas Development Institute, London, UK. 4 p.

Bruce, J.W. 1999. Legal bases for the management of forest resources as common property. FAO Community Forestry Note 14. FAO, Rome. 126 p.

Bruce, J.W., Migot-Adholla, S.E. & Atlerton, J. 1994. The Findings and Their Policy Implications: Institutional Adaptation or Replacement. In: Bruce, J.W. and Migot-Adholla, S. (eds.). Searching for land tenure security in Africa. World Bank, Washington D.C. Pp. 251-265.

Bui Dung The, Dang Thanh Ha & Nguyen Quoc Chinh 2004. Rewarding upland farmers for environmental services. Experience, Constraints and Potential in Vietnam. World Agroforestry Centre (ICRAF) Southeast Asia Regional Office Indonesia. 57 p.

Campbell, B. & Shackleton, S. 2001. The organizational structures for community-based natural resources management in Southern Africa. African Studies Quarterly 5, no.3. [Online journal]. Available at: http://web.africa.ufl.edu/asq/v5/v5i3a6.htm. [Cited 2 May 2006].

Carbon Finance Unit 2007. [Internet site]. Forest Carbon Partnership Facility. World Bank Carbon Finance Unit. Available at: http://carbonfinance.org/Router.cfm?Page=Funds&ItemID=24670. [Cited 31 Aug 2007].

Carsan, C. 2007. Sustainable farm timber for smallholder cropping systems. M.Sc.-thesis University of the Free State, South Africa. January 2007. 74 p.

Castella, J-C., Boissau, S.,Nguyen Hai Thanh and Novosad, P. 2002. Impact of forestland allocation on agriculture and natural resources management in Bac Kan Province, Viet Nam. In J.C. Castella and Dang Dinh Quang (eds.). Doi Moi in the Mountains. Land use changes and farmers' livelihood strategies in Bac Kan Province, Vietnam. The Agricultural Publishing House, Ha Noi, Viet Nam. Pp. 197-220.

CFD 2005. Memo. Circular to all 75 districts about the Operational Plan Revision. Department of Forest, Kathmandu, Nepal.

Chakraborty, R., Freier, I., Kegel, F. & Mäscher, M. 1997. Community Forestry in the Terai Region of Nepal. Policy Issues, Experience, and Potential. German Development Institute. Reports and Working Papers 5. Berlin. 130 p.

Chanthalasy, A., Lintzmeyer, F., Rock, F., Soulivanh, B. & Suphida, P. 2005. Study on Land Markets in Urban and Rural Areas of Lao PDR. Bundesministerium für wirtschafliche Zusammenarbeit und Entwicklung. GTZ-German Technical Cooperation. Sector Project Land Management. Vientiane, March 2005. 51 p.

ChFDP 2004. Restoring Balances. Milestones of the Churia Forest Development Project in Eastern Nepal. GTZ. Jagadamba Press, Latipur, Nepal. 134 p.

Chilundo, A., Cau, B., Mubai, M., Malauene, D. & Muchanga, V. 2005. Research Report 6. Land Registration in Nampula and Zambezia Provinces, Mozambique. Securing Land Rights in Africa. IIED. Russell Press, UK. 31 p.

Christ, H. & Kloss, D. 1998. Sustainable Management of Resources in the Lower Mekong Basin Project. Social Forestry Development Project Song La. GTZ, ADB, Hanoi. 54 p.

Christy, L.C., Di Leva, C.E., Lindsay, J.M. & Takoukam, P.T. 2007. Forest Law and Sustainable Development. Addressing Contemporary Challenges Through Legal Reform. The World Bank. Law, Justice, and Development Series. 206 p.

Ciparisse, G. 2003. Multilingual thesaurus on land tenure. English version. FAO, Rome. 97 p.

Colchester, M. 2001. Chapter 6. Asia. In: Colchester, M. (ed.). A Survey of Indigenous Land Tenure in Latin America, Sub-Saharan Africa and Asia. 106 p.

Commons, J.R. 1934. Institutional Economics. Its Place in Political Economy. The MacMillan Company, New York. 921 p.

Compasss 2006. [Internet site]. The comparative methods, small N, QCA and Fuzzy sets international bibliographical database. Available at: http://www.compasss.org/Bibli%20database.htm. [Cited 8 June 2006].

Countries at the Crossroads 2005 - Laos. UNHCR Refworld. Freedom House 5 May 2005. Available at: http://www.unhcr.org/cgi-bin/texis/vtx/refworld/rwmain?docid=47386903c. [Cited 11 Dec 2007].

Deininger, K. 2003. Land Policies for Growth and Poverty Reduction. The World Bank and Oxford University Press. Oxford University Press, Oxford. 239 p.

Deininger, K. & Feder, G. 1998. Land Institutions and Land Markets. Policy Research Working Paper 2014. The World Bank, Development Research Group, Rural Development. 44 p.

Deininger, K. & Feder, G. 2002. Land Institutions and Policy: Key Message of the Policy Research Report. Paper presented at Regional Workshop on Land Issues in Africa. Kampala, Uganda, 29 April-2 May. 74 p.

Demsetz, H. 1967. Toward a Theory of Property Rights. The American Economic Review 57(2): 347-359.

Dev, O.P., Yadav, N.P., Springate-Baginski, O. & Soussan, J. 2003. Impacts of Community Forestry on Livelihoods in the Middle Hills of Nepal. Journal of Forest and Livelihood 3(1): 64-77.

Dewees, P.A. 1995. Social and economic incentives for smallholder tree growing. A Case Study from Murang'a District, Kenya. FAO, Community Forestry Case Study Series.

Dinh Ngoc Minh 2007. Key policies issued by the government on promoting investment from the private sector for forestry development. Paper presented at the Forest Partnership Forum 8th May 2007, Hanoi, Vietnam. 14 p.

DoF 2000. Forest Inventory Guidelines. Kathmandu, Nepal.

DoF 2006 [Internet site]. Programmes under Department. Ministry of Forests and Soil Conservation, Department of Forests. Available at: http://www.dof.gov.np. [Cited 16 Nov 2006].

Donovan, J., Stoian, D., Grouwels, S., McQueen, D., Leeuwen, A., Boetekees, G. & Nicholson, K. 2006. Towards enabling environment for small and medium forest enterprise

development. Policy brief. CATIE, FAO, IIED, SNV and icco.6 p. Available at: www.fao.org/forestry/site/35689/en. [Cited 14 Aug 2007].

Drass, K. 1992. Qualitative Comparative Analysis. QCA Version 3.0. Computer Programme Manual. Center for Urban and Policy Research. Northwestern University, Chicago.

Ducourtieux, O. & Castella, J.-C. 2006. Land reforms and impact on land use in the uplands of Vietnam and Laos: Environmental protection or poverty alleviation? Colloque international "Les frontières de la question foncière – At the frontier of land issues", Montpellier, 2006. 22 p.

Eggertsson, T. 1990. Economic behaviour and institutions. Cambridge University Press, New York, USA. 385 p.

Eggertz, D. 1996. Tenure and Sustainable Use of the Forest Land in Lao PDR. Master Thesis at the Faculty of Law, University of Uppsala. 75 p. + appendixes.

Ellsworth, L. & White, A. 2004. Deeper Roots: Strengthening Community Tenure Security and Community Livelihoods. Ford Foundation. 49 p. Available at: http://www.fordfound.org/elibrary/documents/515/toc.cfm. [Cited at 15 May 2006].

Evrard, O. 2004. La mise en œuvre de la réforme foncière au Laos Impacts sociaux et effets sur les conditions de vie en milieu rural (with Summary in English) FAO Programme d'Appui aux Moyens d'Existence (LSP) Un Programme interdépartemental pour l'amélioration de l'appui aux Moyens d'existence de la population rurale pauvre. LSP Document de Travail 8. 46 p.

FAO 2000. Global Forest Assessment 2000. FAO Forestry Paper 140. FAO, Rome. 357 p. + appendices.

FAO 2001. Governance principles for concessions and contracts in public forests. FAO Forestry Paper 139. Rome.

FAO 2005. Global Forest Resources Assessment 2005. Progress towards sustainable forest management. FAO Forestry Paper 147. FAO, Rome.

FAO 2007a. State of the World Forests 2007. FAO, Rome.

FAO 2007b. [Internet site]. FAO Forestry Department, FRA 2005 Global Tables. Available at: www.fao.org/forestry/site/32038/en. [Cited 19 Nov 2007].

FBD 2006. Participatory Forest Management in Tanzania - Facts and Figures-. Extension and Publicity Unit, Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism. July 2006. 7 p.

FBD, MNRT, Danida, MFA &WB 2005. Joint Review Report (Final) Participatory Forestry Management Programme, Tanzania. 40 p. + Annexes.

Fernandez, L. 2006. Natural resources, agriculture and property rights. Ecological Economics 57(3): 359-373.

Fomété, T. & Vermaat, J. 2001. Community Forestry and Poverty Alleviation in Cameroon. Rural Development Forestry Network. Network Paper 25h(i). DFID, FRR, ODI. Pp. 1-8.
FSSP 2003. Forest Sector Manual. Chapter: Forestry Development Orientation. Forestry Sector Support Programme. June 2003. Available at: http://www.vietnamforestry.org.vn/Cam_nang/CHAPTER_03_EN.pdf. [Cited 8 Nov 2006].

Fujita, Y., Vongvisouk, T., Chantavong, H. & Chanthaleunnavong, S. 2005. Dong Phou Xoy and Dong Sithouane production forests: Paving the way for village forestry. In: Durst, P.B., Brown, C., Tacio, H. and Ishikawa, M. (eds.). In search of excellence. Exemplary Forest Management in Asia and the Pacific. RAP Publication 2005/2. FAO and RECOFTC, Bangkok. Pp. 203-214.

Gautam, M.K., Roberts, E.H. & Singh, B.K. 2003. Community Based Leasehold Approach and Agroforestry Technology for Restoring Degraded Hill Forests and Improving Rural Livelihoods in Nepal. Paper presented at Rural Livelihoods, Forest and Biodiversity Conference, 19-23 May 2003 Bonn, Germany. 15 p. Available at: http//:www. geography.anu.edu.au/research/reports/madan03.pdf. [Cited 20 Mar 2007].

Gjølberg, M. 2007. The Origin of Corporate Social Responsibility: Global Forces or National Legacies? Centre for Development and the Environment (SUM), University of Oslo. Working Paper. 59 p.

Government of Kenya 2003. Economic Recovery Strategy for Wealth and Employment Creation 2003-2007. 48 p. + Annex.

Government of Kenya 2007. Sessional Paper No. 1 of 2007 on Forest Policy. Printed by the Government printer, Nairobi. 21 p.

Government of Lao PDR 2003. National Growth and Poverty Eradication Strategy (NGPES). 151 p.

GRID 2004. Gender, forest resources and rural livelihoods. Ministry of Agriculture and Forestry, National Agriculture and Forestry Extension Service, Sustainable Forestry And Rural Development Project. December 2004. 78 p.

Griffiths, T. 2007. Seeing "Red"? "Avoided deforestation and the rights of Indigenous Peoples and local communities. Forest Peoples Programme. Moreton-in-Marsh, UK. 26 p.

Ha Cong Tuan 2001. Initial Survey of the Current Situation of Community Forest Management in Vietnam. In: Nguyen Hai Nam, Ngyuen hong Quan and Phan Xuan Phuong (eds.). National Workshop on a policy framework to support community forest management in Vietnam. Hanoi, Nov. 14-14, 2001.

Hanna, S., Folke, C. & Mäler, C.-G. 1996. Property Rights and the Natural Environment. In: Hanna, S., Folke, C. and Mäler, C.-G. (eds.). Rights to Nature. Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. Island Press, Washington, D.C. Pp. 1-10.

Hanoi Agricultural University 2001. Government Policies on Resource Management and Improvement of the Livelihood of Local Peole in the Ca River Basin, Vietnam. Executive Summary. WRI Institutions and Governance Program REPSI Resources Policy Brief. 11 p.

Hansen, N.J. & Østergaard, J. 2004. Participatory Resource Assessment in Tanzania. Master Thesis. Danish Centre for Forest, Landscape and Planning, the Royal Veterinary & Agricultural University. Copenhagen. 101 p. + Appendices.

Hardin, G. 1968. The Tragedy of the Commons. Science 162: 1243-8.

Hardin, G. 1994. The tragedy of the unmanaged commons. Trends Ecology and Evolution 9:199. Cited in McKean, M. and Ostrom, E. 1995. Common property regimes in the forest: just a relict from the past? Unasylva 46 (180): 3-15.

Hellström, E. 2001. Conflict Cultures - Qualitative Comparative Analysis of Environmental Conflicts in Forestry. Silva Fennica Monographs 2. 109 p.

HMG 1989. Master Plan for Forestry Sector. Kathmandu Nepal.

HMG 2000. Forestry Sector Policy 2000. Ministry of Forests and Soil Conservation. 34 p.

HMG 2002. Leasehold Forest Policy, 2002. His Majesty's Government, Ministry of Forest and Soil Conservation, Singhdubar, Kathmandu, Nepal. 17 p. (Unofficial translation)

Hobley, M. 2007. Where in the world is there pro-poor forest policy and tenure reform. Rights and Resources Initiative, Washington, DC. 89 p.

Hodgdon, B. 2006. No success like failure: Policy versus reality in the Lao forestry sector. Watershed 12(1): 37-46.

Hodgson, G.M. 1988. Economics and Institutions. A Manifesto for a Modern Institutional Economics. Polity Press. Cambridge, U.K. 365 p.

Hyttinen, P., Niskanen, A. & Ottisch, A. 2000. New challenges for forest sector to contribute to rural development in Europe. Land Use Policy 17: 221-232.

IFAD 2003. Kingdom of Nepal. Hills Leasehold and Forage Development Project. Interm Evaluation. Report No 1431-NP. 84 p.

IUCN 1999. Forest Cover and Forest reserves in Kenya: Policy and practice. IUCN Eastern Africa programme. Revised by V. Matiru. 32 p.

Jackson, G. 2005. Employee Representation in the Board Compared: A Fuzzy Sets Analysis of Corporate Governance, Unionism and Political Institutions. Industrielle Beziehungen 12. Jg, Heft 3.

Johnstone, R., Cau, B. & Norfolk, S. 2004. Forestry legislation in Mozambique: compliance and the impact on forest communities. Terra Firma Lda. Maputo. 61 p.

de Jong, W., Do Dinh Sam, & Trieu Van Hung 2006. Forest Rehabilitation in Vietnam. Histories, realities and future. CIFOR, Jakarta, Indonesia. 76 p.

Kajembe, G.C., Monela, G.C. & Mvena, Z.S.K. 2003. Making community-based forest management work: a case study from Duru-Haitemba village forest reserve, Babati, Arusha, the United Republic of Tanzania. In: Second international workshop on participatory forestry in Africa. Defining the way forward: sustainable livelihoods and sustainable forest management through participatory forestry 18-22 February 2002. FAO, Rome. Pp. 169-172.

Kajembe, G.C., Nduwamungu, J. & Luoga, E.J. 2005. The impact of community-based forest management and joint forest management on the forest resource base and local people's livelihoods: Case studies from Tanzania. Centre for Applied Social Sciences and Programme for Land and Agrarian Studies. CASS/PLAAS Occasional Paper Series No. 8.

Kallabinski, J. & Lundgreen, D. 2004. Land use planning: an approach to poverty reduction and stabilisation of shifting cultivation in the Lao uplands to improve upland livelihoods. NAFRI Workshop proceedings, Shifting Cultivation and Poverty Eradication in the Uplands of the Lao PDR. Pp. 161-168.

Kanel, K.R.K. 2006. Current Status of Community Forestry in Nepal. Submitted to Community Forestry Training Center for Asia and the Pacific. Bangkok, Thailand. 50 p. Available at: http://www.
recoftc.org/site/fileadmin/docs/Country_profile/NepalCFprofile_3_.doc. [Cited 17 Nov 2006].

Karanja F., Tessema Y. & Barrow E. 2002. Equity in the Loita/Purko Naimina Enkiyio Forest in Kenya: Securing Maasai Rights to and Responsibilities for the Forest. IUCN Eastern Africa Programme. Forest and Social Perspectives in Conservation No. 11.

Karmacharya, M., Karna, B. & Ostrom, E. 2003. Rules, incentives and enforcement: Livelihood strategies of community forestry and leasehold forestry users in Nepal. Paper presented at The international Conference on Rural Livelihoods, Forest and Biodiversity 19-23 May, Bonn, Germany. 25 p.

Katila, M. & Puustjärvi, E. 2003. Impact of New Markets for Environmental Services on Forest Products Trade. FAO Impact Assessment of Forest Products Trade in the Promotion of Sustainable Forest Management (GCP/INT/775/JPN). September 15, 2003. 104 p. + Annexes.

Kellert, S.R., Mehta, J.N., Ebbin, S.A. & Lichtenweld, L.L. 2000. Community Natural Resource Management: Promise, Rhetoric, and Reality. Society and Natural Resources 13(8): 705–715.

Ketphanh, S., Mounlamai, K. & Siksidao, P. 2006. Rubber Planting Status in Lao PDR . Paper presented in the NAFRI Workshop on Rubber Development in Lao PDR: Exploring Improved Systems for Smallholder Production, Vientiane, 9-11 May 2006. 8 p.

KFS 2007. [Internet site]. Kenya Forest Service. Partnerships and agreements section. Available at: http://www.kfs.go.ke/pub/Partnership.pdf. [Cited 29 Oct 2007].

Kitapilimwa Government Forest Reserve Iringa, Tanzania Agreement, Bylaw, & Management Plan Iringa, November 2001. 18 p.

Knox, A. & Meinzen-Dick, R. 2001. Collective action, property rights, and devolution of natural resource management: exchange of knowledge and implications for policy. A workshop summary paper. CAPRi Working Paper No. 11. 61 p.

Knox, A., Meinzen-Dick, R. & Hazell, P. 2002. Property Rights, Collective Action, and Technologies for Natural Resource Management: A Conceptual Framework. In: Meinzen-Dick, R., Knox, A., Place, F. and Swallow, B. (eds.). Innovation in Natural Resource Management. The Role of Property Rights and Collective Action in Developing Countries. The Johns Hopkins University Press, Baltimore. Pp. 12-44.

Kumar, N. 2002. The Challenges of Community Participation in Forest Development in Nepal. Operations Evaluation Department (OED), the World Bank, Washington, D.C. 29 p.

Kvist, J. 1999. Welfare Reform in the Nordic Countries in the 1990s: Using Fuzzy-set Theory to Assess Conformity to Ideal Types. Journal of European Social Policy 9(3): 231-252

Landell-Mills, N. & Porras, I.T. 2002. Silver bullet or fools' gold? A global review of markets for forest environmental services and their impact on the poor. Instruments for sustainable private sector forestry series. International Institute for Environment and Development, London. 254 p.

Larson, A. 2002. Natural Resources and Decentralization in Nicaragua: Are Local Governments Up to the Job? World Development 30(1): 17-31.

Larson, B. & Bromley, D. 1990. Property rights, externalities, and resource degradation: locating the tragedy. Journal of Development Economics 33(2): 235-62.

Lewis, J., Shah, A. & Kilahama, F. 2003. Participatory Forest Management. A Report on Lessons Learnt. Indufor Oy and Korongo Ltd, Helsinki and Dar es Salaam. Draft 10.10.03. 71 p.

Libecap, G.D. 1989. Contracting for Property Rights. Cambridge University Press, Cambridge. 132 p.

Lin, H. 2005. Community Forestry Initiatives in Myanmar: an analysis from a social perspective. International Forestry Review 7(1): 27-36.

Lindsay, J. 1998. Designing legal space: law as an enabling tool in community-based management. Plenary presentation, International CBNRM workshop Washington D.C., USA 10-14 May. Available at: http://www.worldbank.org/wbi/sdruralpoverty/conatrem/html/lindsy-paper.html. [Cited 2 Dec 2003].

Livelihoods and Forestry Programme (LFP) 2004. Innovations for Pro-Poor Community Forestry. LFP, Kathmandu. 20 p.

de Lopez, T. 2005. Resource Degradation, Property Rights, Social Capital and Community Forestry in Cambodia. Cambodian Research Centre for Development (CRCD), Policy Trend Report 38: 35-44.

Mackenzie, C. 2005 Forest Governance in Zambesia: Chinese Takeaway. Report for FONGZA, March 2005. 155 p.

MAF 2005. Forest Strategy to the Year 2020. Ministry of Agriculture and Forestry, Vientiane, LAO P.D.R.

Malla, Y. 2000. Impact of community forestry policy on rural livelihoods and food security in Nepal. Unasylva 202, Vol. 51, No. 3: 37-45.

Manivong, K. & Sophathilath, P. 2007. Status of Community Based Forest Management in Lao PDR. RECOFTC. 56 p. + Annexes.

Mansur, E. & Cuco, A. 2002. Building a community forestry framework in Mozambique: local communities in sustainable forest management. Second International Workshop on Participatory Forestry in Africa, Arusha, 18-23 February 2002.

MARD 2001a. Five Million Hectare Reforestation Programme. Synthesis Report. International Cooperation Department, 5MHRP Partnership Secretariat. 120 p. Available at: http://www.isgmard.org.vn/Information%20Service/Report/Forestry/5MHRP%20Final%20Synthesys%20Report.pdf. [Cited 22 Aug 2005].

MARD 2001b. Updated Description of the National Five Million Hectare Reforestation Programme 1998 – 2010. Hanoi, March 2001. 42 p. + annexes.

MARD & UNDP 2003. Farmer Needs Study. Project VIE/98/004/B/01/99. Statistical Publishing House, Hanoi. 191 p.

Marshall, G. 1998. A Dictionary of Sociology. Oxford University Press, New York.

Mawhood, P. 1983. Local Government in the Third World. John Wiley & Sons, UK. 261 p.

McCarthy, J. 2001. Decentralisation, Local Communities and Forest Management in Barito Selatan District, Central Kalimantan. CIFOR, Bogor, Indonesia. 34 p.

McDonald, C. 2000. Assessing common property institutions in the South African countryside. Paper presented to the Eighth Biennial Conference of the International Association for the Study of Common Property (IASCP) Bloomington, Indiana USA, 31st May - 4th of June 2000. 30 p.

McKean, M. 2000. Common property: what is it, what is it good for, and what makes it work? In: Gibson, C., McKean, M. and Ostrom, E. (eds.). People and Forests. Communities, Institutions, and Governance. The MIT Press, Cambridge, Massachusetts. 298 p.

McKean, M. & Ostrom, E. 1995. Common property regimes in the forest: just a relic from the past. Unasylva 46. FAO.

Meinzen-Dick, R. & Knox, A. 1999. Collective action, property rights, and devolution of natural resource management: a conceptual framework. In: Meizen-Dick, R., Knox, A. and DiGregorio, M. (eds.). Collective action, property rights, and devolution of natural resource management: Exchange of knowledge and implications for policy. Proceedings of the

International Conference in Puerto Azul, the Philippines, 21-25 June, 1999. DSE/ZEL, Feldafing, Germany. Pp. 41-73.

Meinzen-Dick, R., Knox, A. Swallow, B. & Place F. 2002. Introduction. In: Meinzen-Dick, R., Knox, A., Place, F. and Swallow, B. (eds.). Innovation in Natural Resource Management. The Role of Property Rights and Collective Action in Developing Countries. The Johns Hopkins University Press, Baltimore. Pp. 1-11.

Meinzen-Dick, R., DiGregorio, M. & McCarthy, N. 2004. Methods for studying collective action in rural development. CAPRi Working Paper No.33. International Food Policy Research Institute. Washington, D.C. 29 p.

Mendes, L. 1988. Private and Communal Land Tenure in Morocco's Western High Atlas Mountains: Complements not ideological opposites. Overseas Development Institute, Pastoral Development Network, Paper 26a, September 1988. Available at: http://www.odi.org.uk/pdn/papers/paper26a.html. [Cited 10 Sep 2007].

MENR 2004. Participatory Forest Management Guidelines. June 2004. (Revised version for final comments).

MENR 2007. The Forest (Participation in Sustainable Forest Management) Rules. Draft January 2007. 30 p.

Meshack, C. & Rabed, K. 2007. Balancing Rights, Responsibilities, Costs and Benefits in the Management of Catchment Forests. Tanzania Forest Conservation Group, The Arc Journal, Issue No. 21, September 2007. Pp. 6-7.

Milledge, S.A.H., Gelvas, I. K. & Ahrends, A. 2007. Forestry, Governance and National Development: Lessons Learned from a Logging Boom in Southern Tanzania. TRAFFIC East/Southern Africa /Tanzania Development Partners Group/Ministry of Natural Resources of Tourism, Dar es Salaam, Tanzania. 252 p.

Ministry of Lands 2006. Draft National Land Policy. National Land Policy Secretariat. Ardhi House, Nairobi. 67 p.

MNRT 1998. National Forest Policy. Dar es Salaam 1998. 59 p.

MNRT 2001a. National Forest Programme in Tanzania 2001-2010. 132 p.

MNRT 2001b. Community Based Forest Management Guidelines. Forestry and Beekeeping Division, Dar es Salaam, Tanzania. 64 p

MNRT undated. Administrative and Financial Manual for Participatory Forest Management. MNRT, Forest and Beekeeping Division. 24 p.

MNRT 2006. Community Based Forest Management Guidelines For the establishment of Village Land Forest Reserves and Community Forest Reserves. Dar es Salaam December 2006. 52 p.

MNRT 2007. Joint Forest Management Guidelines For the establishment of Joint Management Agreements in Protection and Production Forests. Draft. Dar es Salaam January 2007. 57 p.

Mogaka, H., Simons, G., Turpie, J., Emerton, L. & Karanja, F. 2001. Economic Aspects of Community Involvement in Sustainable Forest Management in Eastern and Southern Africa. IUCN Eastern Africa Programme. Forest and Social Perspectives in Conservation No. 8.

Molnar, A., Liddle, M., Bracer, C., Khare, A., White, A. & Bull, J. 2007. Community-based forest enterprises in tropical forest countries: status and potential. ITTO, RRI and Forest Trends. 148 p. Available at: http://www.iisd.ca/publications_resources/forests_deserts_land.htm#community. [Cited 15 Aug 2007].

Montagnini, F & Jordan, C.F. 2005. Tropical Forest Ecology. The Basis for Conservation and Management. Springer, Berlin. 295 p.

Morris, J., Hicks, E. Ingles, A. & Ketphanh, S. 2004. Linking Poverty Reduction with Forest Conservation. Case Studies from Lao PDR. IUCN, Bangkok, Thailand. 108 p.

Mustalahti, I. 2007. Handling the stick: practices and impacts of participation in forest management. Case study analyses of Finnish forestry assistance in Tanzania, Mozambique, Laos and Vietnam. Ph.D.Thesis, Faculty of Life Science, University of Copenhagen. 32 p. + Articles + Appendix.

NAFRI, NAFES & NUOL 2005. Improving Livelihoods in the Uplands of the Lao PDR. Volume 1: Initiatives and Approaches. National Agriculture and Forestry Research Institute. Vientiane, Lao PDR. 231 p.

Nagendra, H., Karna, B. & Karmacharya, M. 2005. Examining Institutional Change: Social Conflict in Nepal's Leasehold Forestry Programme. Conservation and Society 3(1): 72-91.

National Planning Commission 2002. The Tenth Plan (Poverty Reduction Strategy Paper) 2002-2007 Kathmandu, Nepal. Available at: http://www.npc.gov.np/tenthplan/docs_in_english.htm. [Cited 15 Aug 2007].

Ndoye, O & Tieguhong, J.C. 2004. Forest Resources and Rural Livelihoods: The Conflict Between Timber and Non-timber Forest Products in the Congo Basin. Scandinavian Journal of Forest Research 19(4): 36-44.

Neef, A. and Schwarzmeier, R. 2001. Land Tenure Systems and Rights in trees and Forests: Interdependencies, dynamics and the role of development cooperation - Case studies from mainland Southeast Asia. GTZ Division 4500 Rural development. 97 p.

Neef, A., Onchan, T. & Schwarzmeier, R. 2003. Access to natural resources in Mainland Southeast Asia and implications for sustaining rural livelihoods - The case of Thailand. Quarterly Journal of International Agriculture 42(3): 329-350.

Nelson, J. 2001. Chapter 5. Sub-Saharan Africa. In: Colchester, M. (ed.). A Survey of Indigenous Land Tenure in Latin America, Sub-Saharan Africa and Asia. 106 p.

Nelson, K. 2004. The Last Resort. Determinants of the Generosity of Means-Tested Minimum Income Protection in Welfare Democracies. Swedish Institute for Social Research, Stockholm University. Available at: http://www.compasss.org/Nelson2004.pdf. [Cited 8 June 2006].

Nemarundwe, N. 2004. Social Charters and Organisation for Access to Woodlands: Institutional Implications for Devolving Responsibilities for Resource Management to the Local Level in Chivi District, Zimbabwe. Society and Natural Resources 17: 279-291.

Neupane, H. 2003. Contested Impacts of Community Forestry on Equity: Some Evidence from Nepal. Journal of Forest and Livelihood 2(2): 55-62.

Nguyen Ba Ngai, Nguyen Hong Quan & Kuester, E. 2005. Vietnam Community Forestry 2005. In: RECOFTC First Regional Community Forestry Forum - Regulatory Frameworks for Community Forestry in Asia - Proceedings of a Regional Forum held in Bangkok, Thailand August 24-25, 2005.

Nguyen Hong Quan 2003. Opening Address. In: Workshop Proceedings. National Workshop on Allocation and Management of Natural Forest in Community Forestry. Hanoi 22nd May, 2003. Pp. 7-9.

Nguyen Quang Tan 2005. What benefits and for whom? Effects of Devolution of Forest Management in Dak Lak, Vietnam. Shaker Verlag, Aachen. 248 p. + appendixes.

Nguyen Quang Tan 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: are they contributing to better forest management and poverty reduction? Case study from Viet Nam. In: Understanding forest tenure in South and Southeast Asia. FAO Forest Policy and Institutions Working Paper 14. FAO, Rome. Pp. 355-401.

Nguyen Van San & Gilmour, D. 1999. Forest Rehabilitation Policy and Practice in Vietnam. In: Proceedings of a National Workshop Hoa Binh, Vietnam 4th-5th November. IUCN.

Nguyen Van Thinh, Pham Minh Thoa, Ho Viet Sac, Botillen, O., Vu Hoai Minh & Warfvinge, H. 2000. Field Assessment of Projects in the National Five Million Hectare Reforestation Programme. Team South. Partnership for the National Five Million Hectare Reforestation Programme MARD-UNDP PROFOR Hanoi, Viet Nam. 33 p.

Nguyen Van Xuan 2003. The allocation of natural forests in Dak Lak. Opportunities and challenges. In: Workshop Proceedings. National Workshop on Allocation and Management of Natural Forest in Community Forestry, Hanoi, 22nd May 2003.

Nhantumbo, I. & Macqueen, D. 2003. Direitos das Comunidades Realidade ou retórica. Síntese das conclusões e r ecomendações principais da consulta na Zona Norte (Cabo Delgado, Niassa e Nampula) Zona Centro (Manica, Sofala, Zambézia e Tete) e na Zona Sul (Maputo, Gaza e Inhambane). DNFFB, Maputo, Mozambique. 64 p.

Norfolk, S. 2004. Examining access to natural resources and linkages to sustainable livelihoods. A case study of Mozambique. FAO Livelihood support programme Working Paper 17. 69 p.

Norfolk, S., Nhantumbo, I. Pereira, J. & Matsimbe, Z. 2001. Sustainable Livelihoods in Southern Africa. Institutions, Governance and Policy Processes. Mozambique Mapping Phase Report 1 of 2. Available at: http://www.ids.ac.uk/ids/env/PDFs/MozambiqueMappingReport1.pdf. [Cited 16 Mar 2004].

North, D.C. 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge. 152 p.

North-Nyang'oro woodlands Forest Reserve Iringa, Tanzania Agreement, Bylaw & Management Plan 2001. Iringa December 2001. 29 p.

Nygren, A. 2005. Community-Based Forest Management within the Context of Institutional Decentralization in Honduras. World Development 33(4): 639-655.

Odera, J. 2004. Lessons Learnt in Community Forest Management in Africa. National Museums of Kenya, Nairobi, Kenya. 76 p. Available at: http://www.afornet.org/images/pdfs/Community%20forest%20management.pdf. [Cited 20 Sep 2007].

Ojanperä, S. & Siltanen, M. 2005. Sustainable Forestry and Rural Development (SUFORD) Project, Lao PDR. External Mid-term Review Report. Impact Consulting Oy Ltd, December 2005. 41 p.

Ojha, H. 2000. Current Policy Issues in NTFP Development in Nepal. Asia Network for Small-Scale Bio-Resources. Katmandu, Nepal. 5 p.

Ojha, H., Paudel, K. & Neupane, H. 2003. Biodiversity Assessment for Whom? Issues, Perspectives and Lessons from Community Forestry in Nepal. Forest Resources Studies and Action Team Ekantakuna, Jawalakhel, Kathmandu, Nepal. Discussion Note April, 2003 16 p.

O'Reilly, S. 2000. Joint Forest Management in Vietnam - A concept with a future? Experiences from the Northern Mountains. Paper presented at EC workshop on sustainable rural development in the Southeast Asian mountainous region. Hanoi, 28-30 November. 11 p.

Ostrom, E. 1990. Governing the Commons. The Evolution of Institutions for Collective Action. Cambridge University Press, New York, USA. 280 p.

Ostrom, E. 1999. Self-Governance and Forest Resources. CIFOR Occasional Paper No. 20. 15 p.

Ostrom, E. & Nagendra, H. 2006. Inaugural Article: Insights on linking forests, trees, and people from the air, on the ground, and in the laboratory. Proceedings of the National Academy of Sciences of the United State of America. PNAS 103(51): 19224-19231 Available at: www.pnas.org/cgi/doi/10.1073/pnas.0607962103. [Cited 27 Aug 2007].

Ostrom, E. & Schlager, E. 1996. The Formation of Property Rights. In: Hanna, S., Folke, C. and Mäler, K-G. (eds.). Rights to Nature. Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. Island Press, Washington, D.C. Pp. 127-156.

Ottisch, A. & Weiss, G. 2000. European mountain forest policies - a comparative analysis. In: Price, M.F. and Butt, N. (eds.). Forests in Sustainable Mountain Development: a State of Knowledge Report for 2000. Task Force on Forests in Sustainable Mountain Development. CABI Publishing. Pp. 415-421.

Pagdee, A., Kim, Y.-S. & Daugherty, P.J. 2006. What Makes Community Forest Management Successful: A Meta-Study From Community Forests Throughout the World. Society and Natural Resources 19: 33-52.

Panayotou, T. & Ashton, P.S. 1992. Not by Timber Alone: Economics and Ecology for Sustaining Tropical Forest. Island Press, Washington, D.C.

Pham Xuan Phuong 2003. Survey report on allocation of existing forest and benefit sharing policy in Son La province. In: Workshop Proceedings. National Workshop on Allocation and Management of Natural Forest in Community Forestry, Hanoi, 22nd May 2003.

Phanthanousy, B. & Sayakoummane, S. 2005. Lao PDR Community Forestry in Production Forest 2005. In: O'Brien, N., Matthews, S. & Nurse, M. (eds.). First Regional Community Forestry Forum: Regulatory Frameworks for Community Forestry in Asia. Proceedings of a Regional Forum held in Bangkok, Thailand August 24-25, 2005. RECOFTC, Bangkok Thailand. 159 p.

Pearse, P. 1990. Introduction to Forestry Economics. University of British Columbia Press, Vancouver. 248 p.

Place, F., Roth, M. & Hazell, P. 1994. Land tenure security and agricultural performance in Africa: Overview of research methodology. In: Bruce, J.W. and Migot-Adholla, S. (eds.). Searching for land tenure security in Africa. World Bank, Washington D.C. Pp. 15-39.

Poffenberger, M. (ed.). 1999. Communities and Forest Management in Southeast Asia. A Regional Profile of the Working Group on Community Involvement in Forest Management. Apollo Press, Berkley. 137 p.

Poteete, A.R. & Ostrom, E. 2002. An institutional approach to the study of forest resources. Forthcoming in: Poulsen, J. (ed.). Human Impacts on Tropical Forest Biodiversity and Genetic Resources. CABI Publishing, New York.

Poteete, A.R. & Ostrom, E. 2004. Heterogeneity, Group Size and Collective Action: The Role of Institutions in Forest Management. Development and Change 35(3): 435–461.

Pulhin, J.M. 2000. Community Forestry in the Philippines: Paradoxes and Perspectives in Development Practice. Paper presented at the Eight Biennial Conference of the International Association for the Study of Common Property (IASCP), Bloomington, Indiana, USA, May 31-June 4, 2000. 28 p.

Ragin, C. 1987. The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies. University of California Press, California, USA. 185 p.

Ragin, C. 1994. Constructing Social Research. The Unity and Diversity Method. Pine Forge Press, Thousand Oaks, California, USA. 194 p.

Ragin, C. 2000. Fuzzy-Set Social Science. The University of Chicago Press, Chicago, USA. 352 p.

Ragin, C. 2005. From Fuzzy Sets to Crisp Thruth Tables. Compass Working Paper, WP2004-28. Available at: http://www.compass.org/wp.htm. [Cited 30 May 2007].

Ragin, C. 2007. Qualitative Comparative Analysis Using Fuzzy Sets (fsQCA). Forthcoming in Rihoux, B. and Ragin, C. (eds.). Configurational Comparative Analysis. Sage Publications Thousand Oaks, CA and London.

Ragin, C., Drass, K.A. & Davey, S. 2006. Fuzzy-Set/Qualitative Comparative Analysis 2.0. Department of Sociology, University of Arizona, Tucson, Arizona.

Reeb, D. & Romano, F. 2006. Overview. In: Understanding Forest Tenure in South and Southeast Asia. FAO, Forest Policy and Institutions Working Paper 14. FAO, Rome. Pp. 1-26.

Republic of Kenya 2004. Investment programme for Economic Recovery Strategy for Wealth and Employment Creation 2003-2007. March 12, 2004. 71 p. + Appendixes.

Republic of Mozambique 2001. Action Plan for the reduction of Absolute Poverty (2001-2005) (PARPA) (Strategy Document for the Reduction of Poverty and promotion of Economic Growth) Final Version Approved by the Council of Ministers April 2001 129 p. + Annexes.

Reyes, D. 2003. An Evaluation of Commercial Logging in Mozambique. Collaborative for Development Action, Cambridge, USA. 23 p.

Ribeiro, A. 2001. Natural Resource Management Policy in Mozambique: an overview. Marena Research Project Working Paper no. 7. 17 p.

Ribot, J. 2003. Democratic Decentralisation of Natural Resources: Institutional Choice and Discretionary Power Transfers in Sub-Saharan Africa. Public Administration and Development 23(1): 53-65.

Ribot, J. & Peluso N. 2003. A Theory of Access. Rural Sociology 68(1): 153-181.

Richards, M. 1997. Common Property Resource Institutions and Forest Management in Latin America. Development and Change 28: 97-117.

Rock, F. 2004. Comparative Study on Practices and Lessons in Land Use Planning and Land Allocation in Cambodia, Lao PDR, Thailand and Vietnam. MRC-GTZ Cooperation Programme. Agriculture, Irrigation and Forestry Programme. Watershed Management Component. Working Paper 05. Plascasier, May 2004. 57 p.

Roth, P. 2004. Training on CBFM. Rural Development Project Dak Lak (RDDL) Vietnam. Short Term Consultancy Report No. 7, Volume I. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. 15 p.+ Annexes.

Rudel, T. & Roper, J. 1996. Regional Patterns and Historical Trends in Tropical Deforestation, 1976-1990: A Qualitative Comparative Analysis. Ambio 25(3): 160-166.

Salomão, A.I.A. 2004. Legal frameworks for participatory natural resources management: privileges or rights in Mozambique. World Resources Institute, Environmental Governance in Africa, Working Paper #17. WRI, Washington, D.C.

Sarin, M., Singh, N.M., Sundar, N. & Bhogal, R.J. 2003. Devolution as a Threat to Democratic Decision-making in Forestry? Findings from Three States in India. Working Paper 197. ODI, London. 72 p.

Scherr, S.J., White, A. & Kaimowitz, D. 2003. A New Agenda for Conservation and Poverty Reduction. Making Forest Markets Work for Low-Income Producers. Forest Trends, CIFOR. Forest Trends, Washington, DC. 90 p.

Schindele, W. (ed.) 2004. Management of Pilot Watershed Areas in Lao PDR. Baseline Survey. MRC-GTZ Cooperation Programme, Agriculture, Irrigation and Forestry Programme, Watershed Management Project (WSMP). Working Paper 13a. Vientiane, Dec. 2004. 22 p.

Schlager, E. & Ostrom, E. 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. Land Economics 68(3): 249-62.

Schneider, C.Q. & Wagemann, C. 2006. Reducing Complexity in Qualitative Comparative Analysis (QCA): Remote and Proximate Factors and the Consolidation of Democracy. Forthcoming in European Journal of Political Research.

Seidel, K., Phanvilay, K., Vorachit, B., Mua, L., Boupphachan, S. & Oberndorf, R.B. 2007. Study on Communal Land Registration in Lao PDR. Land Policy Study No 6 under LLTP II. February 2007. 55 p. + Appendixes.

Shackleton, S., Campbell, B., Wollenberg, E. & Edmunds, D. 2002. Devolution and Community-Based Natural Resource Management: Creating Space for Local People to Participate and Benefit? ODI Natural Resource Perspectives Number 76, March 2002. 6 p.

Sikor, T. & Tran Ngoc Thanh 2007. Exclusive versus inclusive devolution in forest management: Insights from forest land allocation in Vietnam's Central Highlands. Land Use Policy 24(4): 644-653.

Simpler Forest Management Plans for Participatory Forestry 2004. FAO Working Paper. Forestry Policy and Institutions Service, Forestry Policy and Information Division, Forestry Department, FAO, Rome. 68 p.

Singh, H.B. 2005a. Shree Binayak Pimidanda Community Forest: More than a Paper Tiger. In: Durst, P.B., Brown, C., Tacio, H.D. and Ishikawa, M. (eds.). In Search of Excellence: Exemplary forest management in Asia and the Pacific. RAP Publication: 2005/02. FAO Regional Office for Asia and the Pacific and Regional Community Forestry Training Center for Asia and the Pacific, Bangkok.

Singh, H.B. 2005b. Chaubas-Bhumlu Community Sawmill: Empowering Local People. In: Durst, P.B., Brown, C., Tacio, H.D. and Ishikawa, M. (eds.). In Search of Excellence:

Exemplary forest management in Asia and the Pacific. RAP Publication: 2005/02. FAO Regional Office for Asia and the Pacific and Regional Community Forestry Training Center for Asia and the Pacific, Bangkok.

Singh, B.K. & Chapagain, D.P. 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: are they contributing to better forest management and poverty reduction? Community and leasehold forestry for the poor: Nepal case study. In: Understanding Forest Tenure in South and Southeast Asia. Part two - Case Studies. FAO, Rome. Pp. 115-151.

Sjaastad, E. & Bromley, D. 2000. The prejudices of property rights: on individualism, specificity, and security in property regimes. Development Policy Review 18(4): 365-389.

Socialist Republic of Vietnam 2003. The Comprehensive Poverty Reduction and Growth Strategy. Hanoi. 161 p.

Soulivanh, B., Chanthalasy, A., Suphida, P. & Lintzmeyer, F. 2004. Study on Land Allocation to Individual Households in Rural Areas of Lao PDR. Bundesministerium für wirtschafliche Zusammenarbeit und Entwicklung. GTZ-German Technical Cooperation. Sector Project Land Management. Vientianne, December 2004. 81 p.

Springate-Baginski, O., Blaikie, P., Dev, O.P., Yadav, N.P. and Soussan, J. 2002. Community Forestry in Nepal. Improving policy-livelihood relationships in South Asia. Policy Review Paper 3. Stockholm Environmental Institute, York. 19 p. + appendices.

Springate-Baginski, O. Dev, O.P., Yadav, N.P. & Soussan, J. 2003. Community Forest Management in the Middle Hills of Nepal: The Changing Context. Journal of Forest and Livelihood 3(1): 5-20.

Stanford, J., Franjic, A.-M. & Abbott, P. 2006. Vietnam Land Administration Project. 11th May 2006. Department of Geomatics, University of Melbourne. 19 p.

Statz, J. 2000. Entwicklungpotenziale der Nutzung von Nicht-Holz-Waldprodukten. perspektiven für ein neues Handlungfeld der forstlichen Entwiklungszusammenarbeit in Paraguay and Bolivien. Im Auftr. des Bundesministeriums für Wirtschaftliche Entwicklung (BMZ) GTZ, Eschborn. 112 p.

Stern, N. 2007. The Economics of Climate Change: The Stern Review. Cambridge University Press. Cambridge U.K. 712 p.

Swallow, B., Meinzen-Dick, R. and van Noordwijk, M. 2005. Localizing demand and supply of environmental services: interactions with property rights, collective action and the welfare of the poor. CAPRi Working Paper 42. 45 p.

Swedberg, R. 2005. The Max Weber Dictionary: Key Words and Central Concepts. Stanford University Press, Stanford, California. 344 p.

Swinkels, R & Turk, C. 2006. Explaining Ethnic Minority Poverty in Vietnam: a summary of recent trends and current challenges. World Bank, Vietnam. Background paper for CEMI MPI meeting on Ethnic Minority Poverty Hanoi, 28 September 2006. 19 p.

Thoms, C.A., Karna, B.K. & Karmacharya, M.B. 2006. Limitations of Leasehold Forestry for Poverty Alleviation in Nepal. Society and Natural Resources 19: 951–958.

Thongmanivong, S. & Fujita, Y. 2006. Recent Land Use and Livelihood Transitions in Northern Laos. Mountain Research and Development 26(3): 237-244.

Tran Duc Vien, Nguyen Vinh Quang & Mai Vanh Thanh 2005. Decentralization Process and Its Impacts on Livelihoods of Ethnic Minority Groups: A Study on Decentralization Process in Forest Management in Northern and North Central Uplands of Vietnam. Agricultural Publishing House, Hanoi 2005. 87 p.

Tran Ngoc Thanh & Sikor, T. 2005. From legal acts to actual powers: Devolution and property rights in Central highlands of Vietnam. Forest Policy and Economics. In press.

Tran Ngoc Than, Nguyen Quang Tan & Sikor, T. 2004. The Local Outcomes of Forest Land Allocation: Evidence from Dak Lak. Dak Lak Department of Agriculture and Rural Development, Research Project on Assessment Methods for Forest Land Allocation. 50 p.

UN 1992. Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992. Annex III, non-legally binding authorative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests. Available at: http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm. [Cited 9 Aug 2006].

UN 2006. [Internet site]. Millennium Development Goals. United Nations. Available at: http://www.un.org/millenniumgoals/#. [Cited 2 May 2006].

UN 2007. The Millennium Development Goals Report 2007. UN, New York. 36 p.

UNDP 2002. [Internet site]. Equator prize 2002 finalists. Available at: http://www.undp.org/equatorinitiative/secondary/equator_prize2002htm#kenya. [Cited 8 Sep 2005].

UNDP 2004. [Internet site] Global Environmental Facility Small Grants Programme Community Approach to the Rehabilitation of Mt Kenya World Heritage Site. Available at: http://www.ke.undp.org/GEF-SGP/Mt.%20Kenya%20COMPACT%20Project/main.htm. [Cited 16 Aug 2005].

UNHCR 2007. [Internet site] Human Rights Watch World Report 2003 - Vietnam. Available at: http://www.unhcr.org/home/RSDCOI/3e2818574.html. [Cited 10 Dec 2007].

United Republic of Tanzania 2005. National Strategy for Growth and Reduction of Poverty (NSGRP). Available at: http://www.povertymonitoring.go.tz/downloads/new/nsgrptext.pdf [Cited 11 Aug 2005].

Veltheim, T. & Kijazi, M. 2002. Lessions learned on participatory forest management. East Usambara Conservation Area Management Programme Technical Paper 61. FDB, Department of International Co-operation, Finland and Metsähallitus Consulting Oy. Tanga 2002. 25 p.

Vietnam-Finland Forestry Sector Co-Operation Programme. Phase II:1999-2003. Community Forest Management -A Study on Institutional Aspects. Final Report. 2000. Ministry of Foreign Affairs, Department for International Co-Operation, Helsinki Finland.

Vo Dai Hai 2003. Farm forestry and its contribution to rural livelihoods in Viet Nam. In Proceedings of the regional workshop on forests for poverty reduction: can community forestry make money. 1-2 Sept., 2003. Beijing, China. 9 p.

Vrije Universiteit 2001. External Evaluation: Mount Elgon Integrated Conservation and Development Project. Nairobi/Amsterdam 31 March 2001. 21 p.

Vu Hoai Minh & Warfinge, H. 2002. Issues in the management of natural forest by households and local communities of three provinces in Vietnam: Hoa Binh, Nghe An and Thia Thien-Hhue. Asia Forest network, Working Paper Series, Volume 5. Asia Forest Network Santa Barbara, California, USA. 47 p.

Vu Huu Tuynh. 2001. Summary Report of an Analysis of Application and Implementation of Forestry Policies in the 5 Provinces under MRDR Program. In: Nguyen Hai Nam, Nguyen Hong Quan and Pham Xuan Phuong (eds.). National Workshop on a Policy Framework to Support Community Forest Management in Vietnam. Hanoi, Nov. 14-15.

Wade, R. 1988. Village Republics. Economic conditions for collective action in South India. Cmabridge University Press, Cambridge, U.K. 238 p.

Wahby, D. 2006. Dak Lak community forest management pilots. Box 2. in FSSP Newsletter Vol.16 Sept., 2006.

Waiganjo, C. & Ngugi, P.E.N. 2001. The Effects of Existing Land tenure Systems on Land Use in Kenya Today. In: Proceedings from International Conference on Spatial Information for Sustainable Development. Nairobi, Kenya 2-5 October, 2001. 10 p.

Wayumba, G. 2004. A Review of Special Land Tenure Issues in Kenya. Expert Group Meeting on Secure Land Tenure: New legal frameworks and tools. Nairobi, Kenya 10-12 November, 2004. 11 p. Available at: http://www.fig.net/commission7/nairobi_2004/papers/ts_06_3_wayumba.pdf. [Cited 12 Oct 2005].

Wells, A, Luttrell, C., Brown, D. & Bird, N. 2006. Public Goods and Private Rights: the Illegal Logging Debate and the Rights of the Poor. ODI Briefing Number 9, February 2006. 5 p.

West Kilombero Forest Reserve Iringa, Tanzania. Agreement, Bylaw, & Management Plan Iringa, February 2002. 37 p.

White, A. 2003. A Framework for Assessing Tenure Security. In: Ellsworth, L. and White, A. (eds.). Deeper Roots: Strengthening Community Tenure Security and Community Livelihoods. Ford Foundation. Pp. 9-16.

White, A. & Martin, A. 2002. Who owns the world's forests? Forest tenure and public forests in transition. Forest Trends, Washington, D.C. 30 p.

Wiebe, K. & Meinzen-Dick, R. 1998. Property rights as policy tools for sustainable development. Land Use Policy 15(3): 203-215.

Wipatayotin, A. 2007. Community Forest Bill Passed. The Bangkok Post, 22 November 2007.

WB 2004. Sustaining Forests: A Development Strategy. The World Bank, Washington, D.C. 80 p.

WB 2006a. India, Unlocking Opportunities for Forest-Dependent People in India. Agriculture and Rural Development Sector Unit, South Asia Region. Report No. 34481 - IN. Main Report: Volume I. 85 p.

WB 2006b. Strengthening Forest Law Enforcement and Governance. Addressing a Systemic Constraint to Sustainable Development. Environment and Agriculture and Rural Development Departments Sustainable Development Network. World Bank, Washington, DC. 77 p.

WB, Sida & MFA 2001. Lao PDR Production Forest Policy. Status and Issues for Dialog. Volume 1. Main Report. 43 p.

WB & MFA 2005. Sustainable Forestry and Rural Development Project (SUFORD). Mid-Term Review Supervision Mission Aid-Memoir. September 8-10. (Draft) 31 p.

WRM 2004. Kenya: Using Participatory Forest Management Plans to further Community-Based Forest Management. WRM Bulletin Issue Number 81, April 2004

Wunder, S., Bui Dung The & Ibarra, E. 2005. Payment is good, control is better. Why payments for forest environmental services in Vietnam have so far remained incipient. CIFOR, Bogor, Indonesia. 61 p.

WWF 2006. Payments for environmental services An equitable approach for reducing poverty and conserving nature. WWF, Gland, Switzerland. 18 p.

Yadav, N.P., Dev, O.P., Springate-Baginski, O. & Soussan, J. 2003. Forest Management and Utilization Under Community Forestry. Journal of Forest and Livelihood 3(1): 37-50.

Yamane, M. 2001. China’s Recent Forest-related Policies: Overview and Background - From the perspective of economic growth and forest conservation. IGES, Policy Trend Report 2001: 1-12.

Yin, R.K. 1994. Case Study Research. Design and Methods. Applied Social research Methods Series Volume 5. Second Edition. SAGE Publications, Thousand Oaks, California, USA. 153 p.

APPENDIX 1: General data tables on the study countries

The information on the following tables is not comparable with the information given in the descriptions of the study countries in chapters 4.1-4.6. This is due to the different definitions used. The FAO data bellow is based on common definitions and thus enables cross country comparisons.

Table 1. Background information on the study countries (FAO 2007a).

Country	Total land area (1000 ha)	Population (1000)	Rural population % of total	Population density/km^2	GDP /capita (USD 2004)
Laos	23 080	5 792	79	25	372
Nepal	14 300	25 190	85	176	245
Vietnam	32 549	82 162	74	252	500
Kenya	56 914	32 447	60	57	343
Mozambique	78 409	19 129	63	24	270
Tanzania	88 359	36 571	63	41	322

Table 2. Information on forest area, plantation area and area of other wooded land (FAO 2007b).

Country	Total forest area (1000 ha)	Forest area % of land area	Annual change rate % (2000-2005)	Plantation area (1000 ha)	Total area of other wooded land (1000 ha)
Laos	16 142[8]	70	-0.5	224	4 643
Nepal	3 636	25	-1.4	53	1 897
Vietnam	12 931	40	2.0	2 695	2 259
Kenya	3 522	6	-0.3	202	34 920
Mozambique	19 262	25	-0.3	38	40 919
Tanzania	35 257	40	-1.1	150	4 756

Table 3. Information on the ownership of forests and other wooded land (FAO 2007b).

Country	Forest ownership % of total area			Ownership of other wooded land % of total area		
	Public	Private	Other	Public	Private	Other
Laos	100	-	-	100	-	-
Nepal	99.9	0.1	-	100	-	-
Vietnam	56.1	17.7	26.1	-	-	-
Kenya	97.8	2.8	-	90	10	-
Mozambique	100	-	-	100	-	-
Tanzania	99.8	0.2	-	100	-	-

[8] Data for the forest area in Laos is considerably higher than forest area estimates in previous FAO assessments and national estimates. In FRA 2000 the total forest area was estimated to be 12,5 million hectares (54% of the land area) (FAO 2000). According to a national estimate the total forest area in Laos is 9,8 million hectares (41,5% of the land area) (MAF 2005).

APPENDIX 2: Main official documents in chronological order by country

Laos

Decree 117/CCM/1989. Issued by the Council of Ministers on the Management, Use of Forest and Forest Land. October 5, 1989.

Contract Law, Law No. 2 1990. July 10, 1990.

Decree 102/PM/1993. Issued by the Prime Minister on the Organization and Administration of Village. July 5, 1993.

Decree 169/PM/1993. Issued by the Prime Minister on the Management of Forest and Forest Land. November 3, 1993.

186/PM/994. Issued by the Prime Minister on the Allocation of Land and Forest Land for Tree Plantations and Forest Protection. October 12, 1994.

Decision 54/MAF/1996. Issued by MAF on customary Rights and the Use of Forest Resources. March 7, 1996.

Instruction 822/MAF/1996. Issued by MAF on land-forest allocation for management and use. August 2, 1996.

Forestry Law, Law No.1 1996. October 11, 1996.

Land Law, Law No.1 1997. April 12, 1997.

Regulation 221/MAF/2000. Issued by MAF on the Harvesting of Wood and Non-Timber Forest Products. October 13, 2000.

Regulation 535/MAF/2001. Issued by MAF on the Village Forest Management. June 18, 2001.

Decree 59/PM/2002. Issued by the Prime Minister on Sustainable Management of Production Forest Areas. May 22, 2002.

Constitution of Lao PDR. May 6, 2003.

Regulation 0204/MAF/2003. Issued by MAF on Establishment and Sustainable Management of Production Forest. October 3, 2003.

Law on Local Administration, Law No. 47 2003. October 21, 2003.

Revised Land Law, Law No.4 2003. October 21, 2003.

Decree 192/PM/2005. Issued by the Prime Minister on Compensation and Resettlement Caused by Development Project. July 7, 2005.

Nepal

National Parks and Wildlife Conservation Act 2029 (1973). March 11, 1973.

Soil and Watershed Conservation Act 2039 (1982). November 21, 1982.

Decentralization Act 2039 (1982). November 21, 1982, Amended 1984 and 1986.

Forest Act 2049 (1993). January 3, 1993.

Forest Regulation 2051 (1995).

Community Forestry Directive 2052 (1995). Ministry of Forest and Soil Conservation Department of Forests.

Forest inventory guidelines. Department of Forests, Kathmandu, Nepal, 2000.

Vietnam

Constitution of the Socialist Republic of Viet Nam, 1992.

Decree 01/1995/CP. Issued by the Government on the Regulation of the Allotment of Land by State-Owned Enterprises for Agricultural Production, Forestry and Aquaculture. January 4, 1995.

Decision 661/1998/QD-TTg. Issued by the Prime Minister on the target, task, policy and organization for the implementation of the project of planting five million new hectares of forest. July 29, 1998.

Decision 187/1999/QD-TTg. Issued by the Prime Minister on Renovation of the Organization and Management System of State Forest Enterprises. September 16, 1999.

Decree 163/1999/ND-CP. Issued by the Government on assigning and leasing forestry land to organizations, households and individuals for stable and long-term use for forestrial purposes. November 16, 1999.

Inter-Ministerial Circular 62/2000/TTLT/BNN-TCDC. Issued by the Ministry of Agriculture and Rural Development and the General Department of Land Administration on guiding the implementation of land allocation/lease and provision of forest land use right license. June 6, 2000.

Decision 178/2001/QD-TTg. Issued by the Prime Minister on the benefits and obligations of households and individuals assigned, leased or contracted forests and forestry land. November 12, 2001.

Land Law, Law 13/2003/QH11. November 26, 2003.

Law on Forest Protection and Development, Law 29/2004/QH11. November 3, 2004.

Decree 135/2005/ND-CP. Issued by the Government on contractual assignment of agricultural land, production forest land and land with water surface for aquaculture in state-run agricultural farms and forestry farms. November 8, 2005.

Decree 23/2006/ND-CP. Issued by the Government on the implementation of the Law on Forest Protection and Development. March 3, 2006.

Circular 4A2/2006/TT-BNN-LN. Issued by the Ministry of Agriculture and Rural Development on instruction on forest allocation, rental to organisations, family households, individuals and local communities. Draft June 7, 2006.

Decision 186/2006/QD-TTg. Issued by the Prime Minister on Regulation on Forest Management. August 14, 2006.

Decision 106/2006/QD-BNN. Issued by the Ministry of Agriculture and Rural Development on the Promulgation of the Guidelines on Management of Village Community Forest. November 27, 2006.

Decision No. 18/2007/QD-TTg. Issued by the Prime Minister on Vietnam Forestry Development Strategy 2006-2020. February 5, 2007.

Kenya

Government Land Act, Cap 280, 1948.

Land (Group Representatives) Act, Cap 278, 1968.

Trust Lands Act, Cap 288, 1970.

Wildlife Conservation and Management Act, Act no.16 of 1989. December 6, 1989.

Constitution of Kenya, 2001. (Revised edition) Parliament of Kenya web site. Available at: http://www.bunge.go.ke/index.php. [Cited 20 Aug 2007].

Participatory Forest Management Guidelines. Ministry of Environment and Natural Resources June 2004. (Revised version for final comments).

Forests Act 2005, Act No. 7 of 2005.

The Forest (Participation in Sustainable Forest Management) Rules, 2007. Ministry of Environment and Natural Resources 2007. Draft January 2007.

Mozambique

Constitution 1990. November 2, 1990.

Land Law 1997. Law 19/1997. October 1, 1997.

Land Law Regulations 1998. Decree 66/1998. Issued by the Council of Ministers December 8, 1998.

Forestry and Wildlife Law (FWL) 1999. Law 10/1999. July 7, 1999.

Ministerial Diploma 29-A/2000. Issued by Ministry of Agriculture and Fisheries on approving the Technical Annex to the Land Law Regulations. March 17, 2000.

Forestry and Wildlife Law Regulations 2002. Issued by the Council of Ministers. June 6, 2002.

Ministerial Diploma 93/2005. Issued by the Ministry of Agriculture and Rural Development and Ministry of Finance on regulating the distribution among local communities of the 20% of tax funds collected from the use of forest and wildlife resources. May 04, 2005.

Mainland Tanzania

Local Government (District Authorities) Act No. 7, 1982.

Land Act 1999. Act No. 4 1999. May 15, 1999.

Village Land Act 1999. Act No. 5 1999. May 15, 1999.

Community Based Forest Management Guidelines. Ministry of Natural Resources and Tourism, Forestry and Beekeeping Division, Dar es Salaam, Tanzania, 2001.

Forest Act 2002. Act No. 7 2002. July 4, 2002.

Forest Regulations 2004. Government Notice No. 153. May 21, 2004.

Community Based Forest Management Guidelines for the establishment of Village Land Forest Reserves and Community Forest Reserves. Ministry of Natural Resources and Tourism, Dar es Salaam, December 2006.

Joint Forest Management Guidelines For the establishment of Joint Management Agreements in Protection and Production Forests. Ministry of Natural Resources and Tourism, Dar es Salaam, Draft, January 2007.

Administrative and Financial Manual for Participatory Forest Management. Ministry of Natural Resources and Tourism, Forest and Beekeeping Division. Undated.

APPENDIX 3: Main rights, benefits and responsibilities in each case study

Case	Main rights and benefits	Main responsibilities
LAOal	Right to use the allocated land according to given purpose. Entitled to trees planted or rehabilitated by right holder's own labour and funds, with state acknowledgement (Forest Law 1996).	General obligation to protect the land against soil erosion and degradation; land use shall not negative impacts on natural and social environment. Land has to be used for a specific purpose, according to objectives given in the land use contract (Forest Law 1996, Land Law 1997).
LAOvf	Customary use of forest products is allowed, including commercial harvesting of NTFPs when it is not conducted as a business for considerable profit. Customary use should follow village regulations. Trees can be harvested from village production forests for villagers' own use (Forest Law 1996, MAF Regulation 535/2001). Villagers' can participate in the management and benefit sharing in production forest areas within village forests. They benefit through employment and are entitled to a share of timber revenues (about 4% of gross revenues) (MAF Regulation 0204/2002).	Obligation to protect and develop the forest and forest resources, use village forest according to regulations, protect from degradation and destruction, and adopt measures to prevent fire. Draw management and protection regulations for the village forest, implement DAFEO decrees and instructions, and coordinate with DAFEO in drawing a forest management plan. Manage, preserve, protect and rehabilitate the forest, patrol, monitor forest condition and control activities in village forest, and report to DAFEO (Forest Law 1996, MAF Regulation 0535/2001). In production forest areas, need to establish a VFO to represent villagers and to participate in drawing a management plan and in its implementation (MAF Regulation 0204/2002).
NEPcf	Rights to develop, conserve, use and manage forest and sell forest products according to a management plan. Main task is to fulfil the needs of user group members, surplus products can be sold outside the user group. Product prises can be fixed independently. Income can be used for forest and community development activities (Forest Law 1993, Forest Regulation 1995).	Establish a CFUG, draw a management plan with DFO support. Conserve, develop and use forest according to the plan. After harvesting forest products make arrangements to reforest or rehabilitate. Inform DFO about sale of forest products (Forest Law 1993, Forest Regulation 1995).
NEPlf	Forests can be used for producing raw material, afforestation, tourism, agroforestry, operate farms for insects, butterflies and wildlife. Forest products can be consumed and sold according to the management	Prepare a management plan with DFO, make arrangements for protecting the forest, use and protect according to plan, inform DFO about the species and quantities planted. Manage and protect tress existing in the leaseholds area

	plan. Leaseholders do not have rights to the trees existing on the leasehold area. The group can buy these trees at the time of felling at given prices (Forest Law 1993, Forest Regulation 1995).	(Forest Law 1993, Forest Regulation 1995).
VIEal	The rights to manage, use and benefit from forests depend on forest classification. *Natural protection forest*: NTFPs, dry, fallen trees, bamboo, 85-90% of the after-tax value of timber harvested with maximum intensity of 20%. *Protection forest without forest cover*: 20% of the land can be used for agriculture or aquaculture, perennial agricultural trees can be planted, full benefits from these trees and thinning products, 90-95% of the after-tax value of timber harvested with maximum intensity of 20% (100% if households have invested their own capital in planting, but only 10% of the planted area can be harvested annually). *Natural production forest*: agricultural and pharmaceutical plans can be inter-planted, land can be used for grazing, right to use forest products for domestic needs, benefits from timber harvesting depend on the condition of the forest at the time of allocation (range from 2% of the forest products value in rich forest to 100% in secondary depleted forest) *Production forest without forest cover*: 20% of the land can be used for agriculture or aquaculture, all benefits when households have invested in afforestation, if planted with state funding, benefits depend on the project (Decision 178/2001).	General responsibility to protect the forest and to use forests for the stated purposes. Draw and implement plans and measures to protect the forest, prevent and fight illegal activities and fires. Organise the protection and development of protection and production forests according to the laws and regulations. For production forests households need to draw forest management, protection, production and business plans (LFPD 2004).
VIEcon	The benefits from contracted forest depend on the classification of the forest, state of the forest and who invests in the planting of degraded and bare lands.	Use contracted land and forests for the proper purpose, according to the management plan and contract terms. Organise protection, production and exploitation according to the plan or

	Special use forests: payment for forest protection, participation in tourism or service activities *Natural protection forests*: payments for forest protection, fuel wood, NTFPs, thinning products, bamboo, benefits from timber harvesting depend on the condition of the forest at the time of allocation (range from 2% of the forest products value in rich forest to 95% in secondary depleted forest) *Reforestation of protection forest*: payments for planting and tending, agricultural trees can be planted and inter-planted, all products from these trees and thinning products, NTFPs, 20% of the area without forest cover can be used for agriculture, 80-90% of the after tax value of harvested timber, but 100% if households have covered all costs (Decree 178/2001). *Production forests:* forest products from silvicultural measures, agroforestry production, benefits from major forest products are shared according to capital and labour investments according to the contract (Decree 135/2005).	project drawn by the contracting party (Decree 01/1995, Decree 135/2005).
VIEcf	Forest products may be harvested for public purposes, for community members' domestic use and for commercial purposes, part (20-25%) of the allocated forest area without forest cover can be used for agricultural production, combined with aquaculture, for conducting tourism activities. Entitled to receive funding and materials according to special projects, like the 5MHRP. Communities decide on the sale of forest products and prices (Decision 106/2006).	Participate in the forest allocation process and forest management planning and in arraigning the implementation of the plan. Formulate forest protection and development rules, and organise forest protection and development, report to state organisation on forest condition and activities related to forests (LFPD 2004, Decision 106/2006).
KENcp	Can be entitled to collect medicinal herbs, harvest honey, harvest timber and fuel wood for domestic use, to collect grass, or for grazing, collect forest produce for community-based industries, ecotourism and to	Protect, conserve and manage the forest according to the management agreement and management plan; protect sacred groves and protected trees; assist in enforcing the law especially regarding illegal harvesting and help in fire

	recreational activities, plantation establishment, development of wood and non-wood forest products based industries as well as to other benefits agreed upon with the KFS (Forest Act 2005).	fighting; report changes in the forest, which are critical for biodiversity conservation (Forest Act 2005).
MOZcp	Entitled to subsistence use of forest products, employment opportunities, 20% of the forest concession and license fees, 50% of fines resulting from community law enforcement activities (FWL 1999, Regulations 2002). Right to be consulted when forest concessions are allocated to third parties and to negotiate benefits in the form of employment and infrastructure development (FWL 1999).	Local communities should participate in the management of natural resources, conflict resolution and in identification and definition of boundaries of the land that the community occupies as well as in the process of land titling (Land Law 1997). Participate in protecting, conserving and promoting sustainable use of forest and wildlife resources through representation in Local Resource Management Councils (FWL 1999).
TANvfr	Entitled to use and manage the reserve according to the management plan and by-laws and customary rules and practices applicable in the area (Forest Act 2002). Villages are entitled to all benefits from the forest.	Management of village lands (Village Land Act 1999). Draw a management plan and by-laws regarding village land forest reserve (Forest Act 2002). Implementation of management activities, i.e. protection and rehabilitation activities.
TANvma	Benefits are shared according to the joint-forest management agreement. Legally binding provisions for benefit sharing does not exist, but the guidelines for JFM suggest that villages should receive 40% of timber royalties in production forests.	Responsibilities are shared according to the management agreement; legally binding provisions for how to share responsibilities between the state and village do not exist.

APPENDIX 4: Crisp set truth table for developing an empirical typology

Case	USE	MAN	EXC	TRA	DUR	SEC
LAOal	1	0	1	1	1	1
LAOvf	0	0	0	1	0	1
NEPcf	1	1	1	1	1	1
NEPlf	1	1	1	0	1	0
VIEal	1	0	1	1	1	1
VIEcon	1	0	1	0	1	1
VIEcf	1	0	1	1	1	1
KENcp	1	0	0	0	0	0
MOZcp	0	0	0	1	1	1
TANvfr	1	1	1	1	1	1
TANvma	0	0	1	1	0	1

UNIVERSITY OF HELSINKI
Viikki Tropical Resources Institute
VITRI

TROPICAL FORESTRY REPORTS

No. 1 Johansson, S. (ed.) 1989. Tutkimus ja kehitysmaiden metsät. Raportti Espoossa 6.–7.10. 1988 pidetystä seminaarista. Forestry research needs in developing countries. Proceedings of seminar held in Espoo 6–7 October 1988 (in Finnish, with an English appendix).

No. 2 Salo, T. 1989. Study on export possibilities of mechanical forest industry products from selected Eastern and Southern African countries.

No. 3 Pietarinen, I. 1989. Agroforestry systems and intergrated land-use in the humid tropics.

No. 4 Johansson, S., Luukkanen, O., Kaarakka, V. & Mulatya, J. 1990. Forestry in irrigation schemes I. Research activities at Bura, Kenya 1984–87.

No. 5 Kaarakka, V., Johansson, S., Luukkanen, O. & Maingi, J. 1990. Forestry in irrigation schemes II. Research activities at Bura, Kenya 1988–89.

No. 6 Sirikul, W. 1990. Shoot growth and flower development in tropical pines: Studies on genetic and environmental variation. Doctoral thesis (limited distribution).

No. 7 Luukkanen, O. & Hakulinen, M. (eds.) 1991. From Bangkok to the Blue Nile. Review of the first decade of the Tropical Silviculture Research Group 1980–1990 and abstracts of Research reports.

No. 8 Otsamo, A., Laxén, J., Johansson S., Kaarakka, V., Kuusipalo, J., Luukkanen O. & Odhiambo Maua, J. 1993. Forestry research in Bura, Kenya 1984–1993. Final report of the research component in Bura Fuelwood Project.

No. 9 Laxén, J., Koskela, J., Kuusipalo, J. & Otsamo, A. (eds.) 1993. Proceedings of the Bura Fuelwood Project research seminar in Nairobi 9–10 March, 1993.

No. 10 Johansson, S. 1995. Forestry in irrigated agricultural schemes with special reference to the Bura Irrigation and Settlement Project, Kenya. Doctoral thesis (limited distribution).

No. 11 Ibrahim, A. M. 1996. Genetic variation in Faidherbia albida: Implications for conservation of genetic resources and tree improvement. Doctoral thesis.

No. 12 Pipatwattanakul, D. 1996. An analysis of the functional and structural basis of the yield in Eucalyptus camaldulensis progenies grown in Thailand. Doctoral thesis.

No. 13 Tuomela, K. 1997. Physiological and morphological responses of *Eucalyptus microtheca* provenances to water availability in tropical drylands. Doctoral thesis (limited distribution).

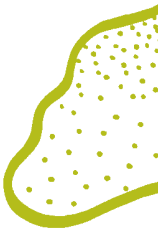
No. 14 Sharawi, H. A. 1997. Socioeconomic evaluation of land-use alternatives in the Blue Nile flood basin of the Sudan. Doctoral thesis.

No. 15 Mustafa, A. F. 1997. Regeneration of Acacia seyal forests on the dryland of the Sudan clay plain. Doctoral thesis.
No. 16 El Fadl, M. A. 1997. Management of Prosopis juliflora for use in agroforestry systems in the Sudan. Doctoral thesis.
No. 17 Kaarakka, V. & Holmberg, G. 1999. Environmental conflicts and development co-operation with special reference to conservation and sustainable management of tropical forests.
No. 18 Li, C. 1999. Drought adaptation and genetic diversity in *Eucalyptus microtheca*. Doctoral thesis (limited distribution).
No. 19 Suoheimo, J. 1999. Natural regeneration of sal (Shorea robusta) in the Terai region, Nepal. Doctoral thesis.
No. 20 Koskela, J. 2000. Growth of grass-stage *Pinus merkusii* seedlings as affected by interaction between structure and function. Doctoral thesis (limited distribution).
No. 21 Otsamo, R. 2000. Integration of indigenous tree species into fast-growing forest plantations on Imperata grasslands in Indonesia - Silvicultural solutions and their ecological and practical implications. Doctoral thesis (limited distribution).
No. 22 Koskela, J., Nygren, P., Berninger, F. & Luukkanen, O. 2000. Implications of the Kyoto Protocol for tropical forest management and land use: prospects and pitfalls.
No. 23 Otsamo, A. 2001. Forest plantations on *Imperata* grassland in Indonesia – Establishment, silviculture and utilization potential. Doctoral thesis (limited distribution).
No. 24 Eshetu Yirdaw 2002. Restoration of the native woody-species diversity, using plantation species as foster trees, in the degraded highlands of Ethiopia. Doctoral thesis.
No. 25 Appiah, M. 2003. Domestication of an indigenous tropical forest tree: Silvicultural and socio-economic studies on Iroko *(Milicia excelsa)* in Ghana. Doctoral thesis.
No. 26 Gaafar Mohamed, A. 2005. Improvement of traditional *Acacia senegal* agroforestry: Ecophysiological characteristics as indicators for tree-crop interaction in western Sudan Doctoral thesis.
No. 27 Glover, Edinam K. 2005. Tropical dryland rehabilitation: Case study on participatory forest management in Gedaref, Sudan. Doctoral thesis.
No. 28 Hares, M. 2006. Community forestry and environmental literacy in northern Thailand: Towards collaborative natural resource management and conservation. Doctoral thesis.
No. 29 Eskonheimo A. 2006. Women, environmental changes and forestry-related development: Gender-affected roles of rural people in land degradation and environmental rehabilitation in a dry region of Sudan. Doctoral thesis.
No. 30 Raddad, E.Y.A. 2006. Tropical dryland agroforestry on clay soils: Analysis of systems based on *Acacia senegal* in the Blue Nile region, Sudan. Doctoral thesis (limited distribution).
No. 31 Luukkanen, O., Katila, P., Elsiddig, E., Glover, E. K., Sharawi, H. and Elfadl, M. 2006. Partnership between Public and Private Actors in Forest-Sector Development.

UNIVERSITY OF HELSINKI
Viikki Tropical Resources Institute
VITRI

TROPICAL FORESTRY REPORTS

No. 32 Laxén, J. 2007. Is prosopis a curse or a blessing? – An ecological-economic analysis of an invasive alien tree species in Sudan. Doctoral thesis.
No. 33 Katila, P. 2008. Devolution of forest-related rights: Comparative analyses of six developing countries. Doctoral thesis.



ISBN 978-952-10-4517-2 (paperback)
ISBN 978-952-10-4518-9 (PDF)
ISSN 0786-8170
Helsinki 2008
Hakapaino Oy